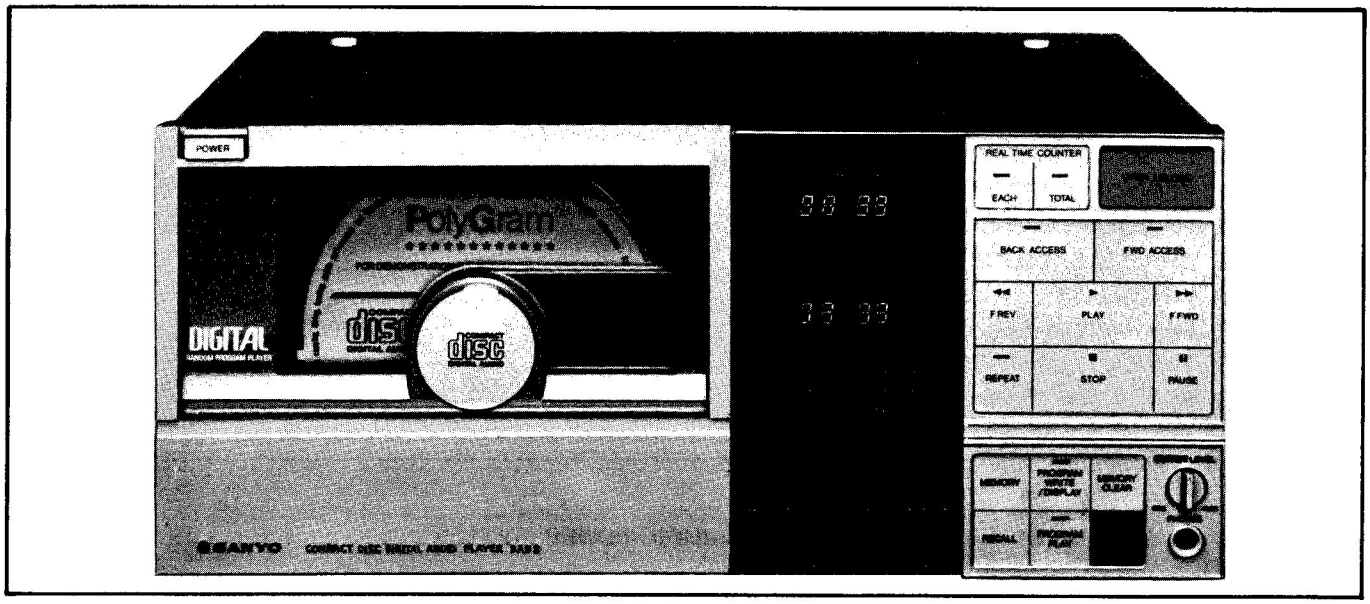
# SERVICE MANUAL

SANYO

# COMPACT DISC PLAYER

# DAD 8




## SPECIFICATIONS

NOTE:

The below mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

**Audio**

| | |
|---|---|
| Channels | 2 channels |
| Frequency response | 5 – 20,000 Hz |
| Dynamic range | greater than 90 dB |
| Channel separation | 90 dB (1 kHz) |
| Distortion | 0.006% (1 kHz) |
| Wow and fiutter | Undetectable |
| Outputs | Output: 1.4 V/470 ohms<br>Phones: 15 mW (at 8 ohms)<br>(impedance range: 8 ohms – 10 kohms) |

**Signal format**

| | |
|---|---|
| Sampling frequency | 44.1 kHz |
| Quantization | 16 bits linear/channel |
| Transmission rate | 4.3218 Mbit/sec. |

**Pickup**

| | |
|---|---|
| System | Objective drive system light pickup |
| Objective drive system | 2-dimensional parallel drive |
| Light source | Semiconductor laser |
| Wave length | 790 nm |

**General**

| | |
|---|---|
| Power supply | AC 110/220 V, 50 Hz |
| Power consumption | 35 W |
| Dimensions (approx.) | 335 (W) x 140 (H) x 270(D) mm<br>(13-1/4" x 5-1/2" x 10-3/4") |
| Weight (approx.) | 6.8 kg (15 lbs) |

WM-10059

* Specifications and design subject to change without notice.

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APPENDIX

A. SCHEMATIC DIAGRAM ① (DIGITAL/AUDIO/POWER SUPPLY) ..... NEW TYPE
   WIRING DIAGRAM ② (PICKUP/SERVO/SYSTEM CONTROL/DISPLAY) ..... NEW TYPE

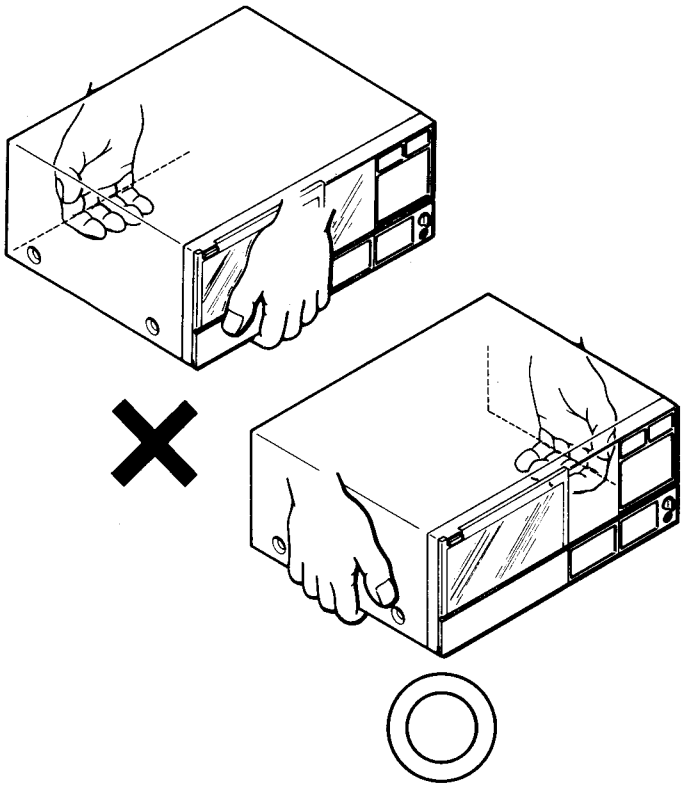
B. SCHEMATIC DIAGRAM ② (PICKUP/SERVO/SYSTEM CONTROL/DISPLAY) ..... NEW TYPE
   WIRING DIAGRAM ① (DIGITAL/AUDIO/POWER SUPPLY) ..... NEW TYPE

C. SCHEMATIC DIAGRAM ① (DIGITAL/AUDIO/POWER SUPPLY) ..... OLD TYPE
   WIRING DIAGRAM ① (DIGITAL/AUDIO) ..... OLD TYPE
   BLOCK DIAGRAM .....

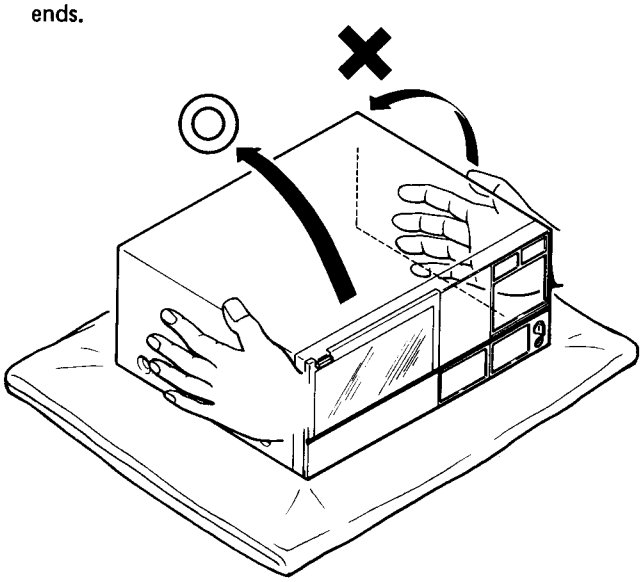
## 2. HANDLING THE COMPACT DISC PLAYER

### (1) Handling

a. Many of the parts within the compact disc player must perform very precise operations.
Extra care should be taken during shipping and unpacking of this unit.
Take care not to touch the front panel, especially the disc holder and disc cover when lifting the unit.

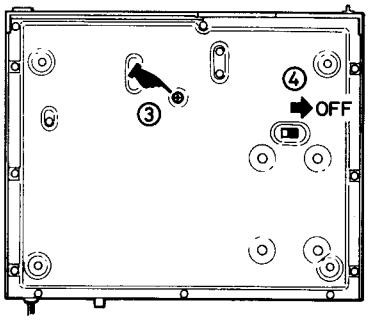


b. Because the delicate pick-up mechanism operates laterally, be careful not to rotate the unit in an end-to-end direction.
If the unit must be turned over, hold both end panels and turn the unit over with the hands holding the ends.



### (2) Unpacking

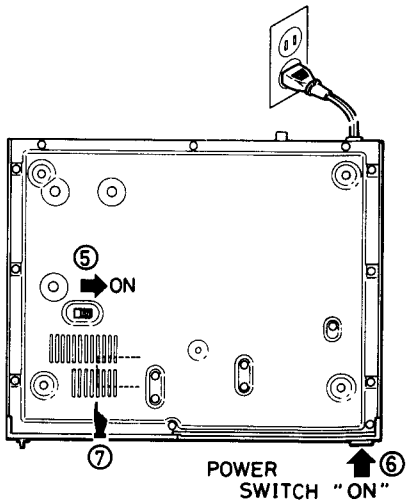
a. Place a soft carpet, cushion or similar material on the table top or other surface.
b. Taking care to handle the unit as cautioned in item (1) – b above, turn the unit over and place it on the carpet.



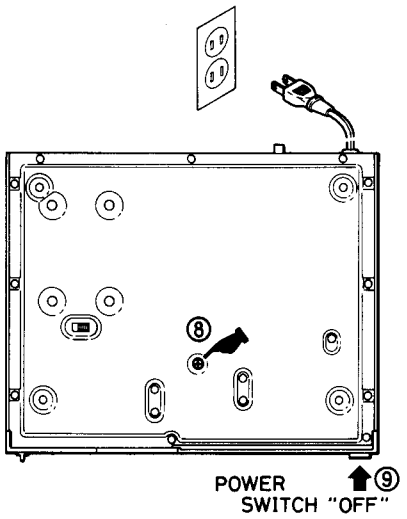

c. Loosen the screw (red) used for shipping.(③)
d. Move the switch for securing the pick-up to the "OFF" position.(④)
e. Carefully turn the unit back over so that it's right side up.
f. Connect the power cord and set the power switch to the "ON" position.
g. Press the OPEN/CLOSE switch and insert a disc.

### (3) Shipment

a. Remove the compact disc from the unit.
b. Set the power switch to the "OFF" position and disconnect the power cord.
c. Place a carpet or cushion on the surface.
d. Turn the unit upside down carefully.



## 3. BEFORE REPAIRING THE COMPACT DISC PLAYER




e. Move the switch to secure the pick-up to the "ON" position.(⑤)
f. Connect the power cord and set the power switch to the "ON" position.(⑥)
g. The shield case for the pick-up will automatically stop when it reaches the fourth ventilation hole from the right.(⑦)
h. Tighten the screw (red) used for shipping.(⑧)
i. Set the power switch to "OFF" and disconnect the power cord.(⑨)

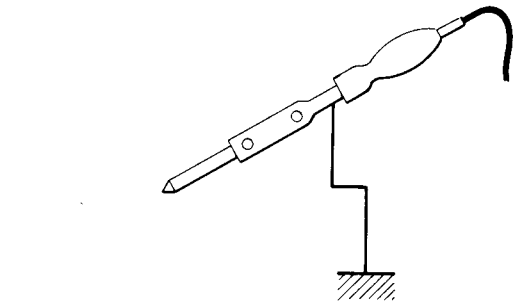
* Note; that touching the switch for securing the pick-up while the pick-up is moving in step (g). will cause the pick-up to stop moving and not be moved again by the circuit (microcomputer).
In this case, move the power switch once to "OFF" and then back to "ON" ; the step (g). operation will then start again.

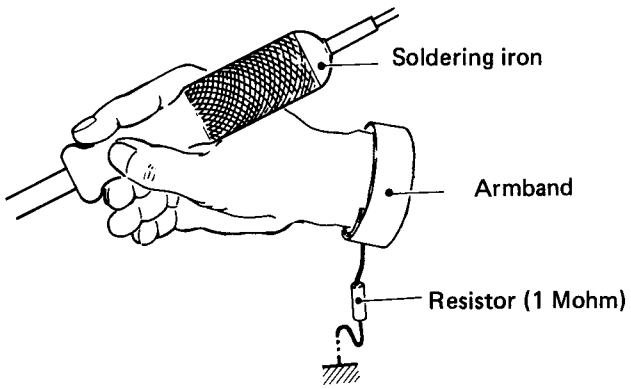
**(1) Preparations**

a. Many ICs, LSI and the pick-up (laser diode) are used in the compact disc player. These components are sensitive to static electricity, and might be damaged by static electricacity or high voltage, so particular care should be taken regarding this point.

b. Many precision componets and the lens are used in the pick-up.
Never attempt to make repairs, or to store parts, where the temperature or humidity is high, where magnetism is strong, or where there is much dust.

**(2) Notes regarding repairs**





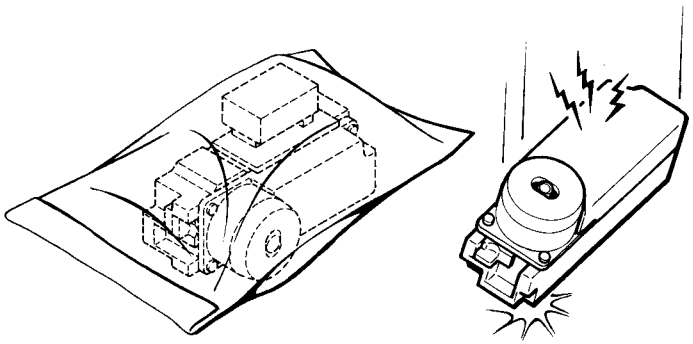

a. Be sure to first disconnect the power plug before attempting to replace any component.
b. All tools, instruments, etc., used for measuring must be grounded.
Grounding can be accomplished by using a conductive metal sheet on the work bench.
c. To prevent AC leakage of the soldering iron, ground its metal part.
d. Repair personnel must be grounded.
e. Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin etc.

## 4. HANDLING THE PICKUP

**(1) Shipping and storage cautions**

a. The pick-up must be stored in a conductive bag until immediately prior to its use.

b. Do not drop it or subject it to impacts.



Conductive bag

**(2) Repair cautions**

a. Be sure to carefully follow the instructions and caution " BEFORE REPAIRING THE COMPACT DISC PLAYER ".

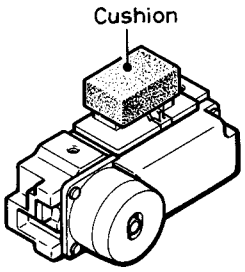
b. The precautions below have been taken in order to prevent damage to the pick-up due to static electricity during transportation.

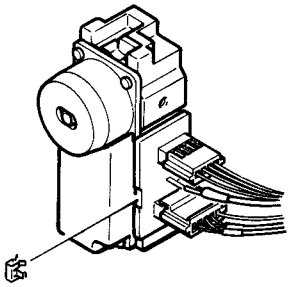
(a) It is in a conductive bag.

(b) A conductive "cushion" is attached at the printed-circuit board terminals. Remove this cushion before connecting the socket.

(c) A clamp pin is attached to the laser diode terminals for short-circuiting.
Do not remove this clamp pin until all steps for replacement of the pick-up have been completed.

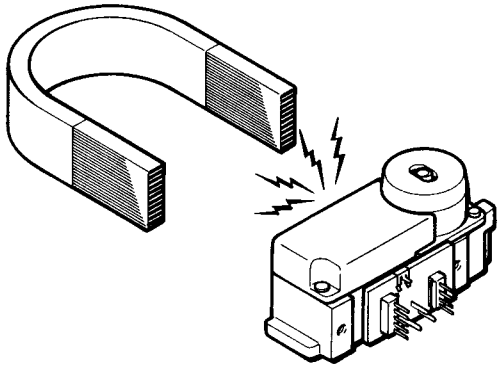
Conductive cushion attached over terminals



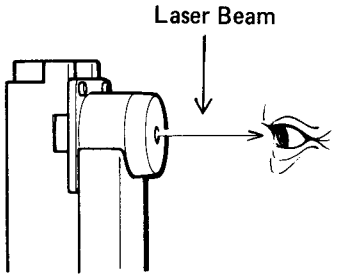



Clamp pin for short-circuiting

c. A strong magnet is used in the pick-up.
Do not bring a magnet or other magnetized object near to it.



d. Eyes may be injured if the laser beam enters.
Take great care to be absolutely sure that the laser beam never enters the eyes.
Do not apply power if there is a broken part in the laser output section of the pickup.

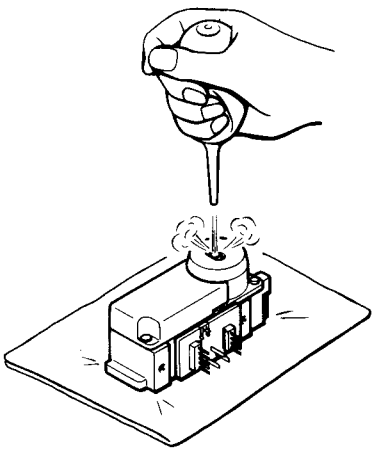



Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin, etc.

e. Cleaning the lens

(a) If dust gets on the lens, clean it away by using an air brush such as used for a camera lens.

(b) The lens is held in place by a spring.
If the center of the lens is dirty, carefully clean by applying a lens cleaning liquid on a cotton swab or similar soft material, and using this to clean, taking care not to bend the lens spring.



f. Do not attempt to disassemble the pick-up.

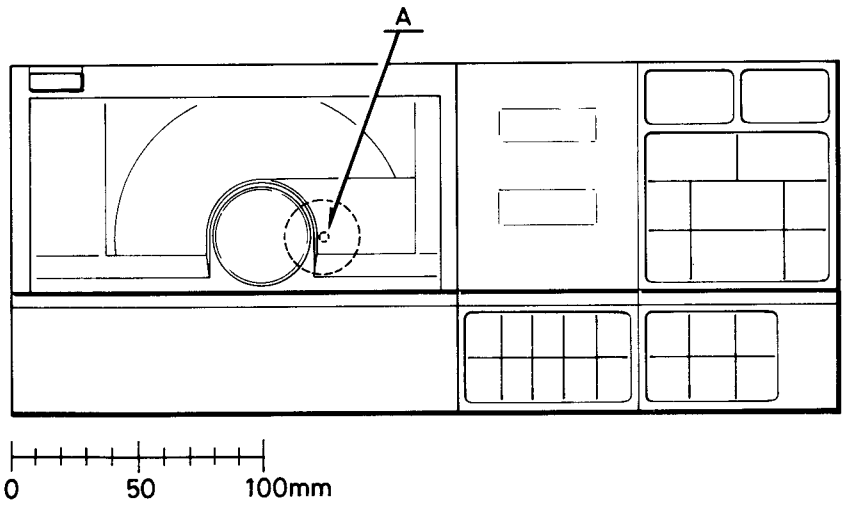
## 5 LASER BEAM SAFETY PRECAUTIONS

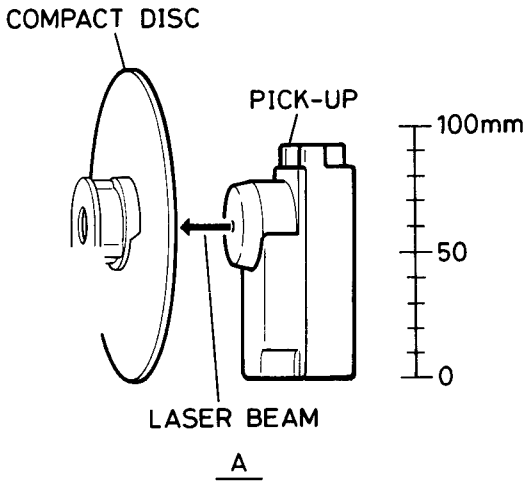
### SAFETY INTERLOCK

a. The pickup used in the compact disc player emits a laser beam.

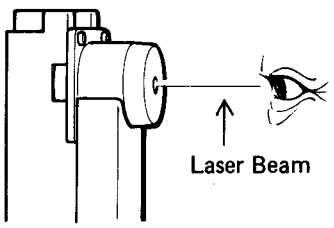
| | |
|---|---|
| **INVISIBLE LASER RADIATION AVOID DIRECT EXPOSURE TO BEAM.** | |
| **MAXIMUM OUTPUT** | **1.0 mW** |
| **WAVE LENGTH IS FROM** | **775 nm~TO 830 nm** |

b. The laser beam is emitted where shown in the illustration.




c. If the disc cover is removed in order to perform service, the pickup is exposed.
Do not look at the pickup with the power switch ON.




Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin, etc.

Do not apply power if there is a broken part in the laser output section of the pickup.

d. Safety interlock circuitry

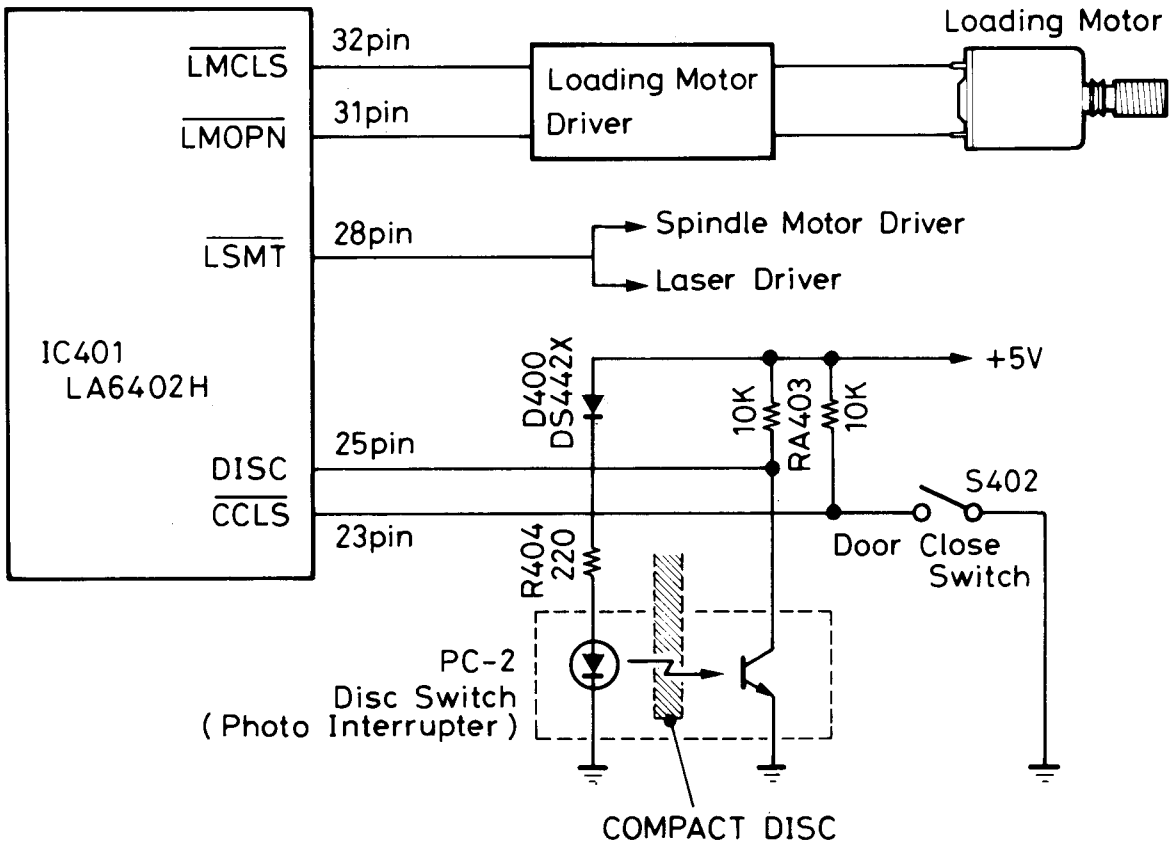



**Fig. 1 Safety Interlock Circuit Diagram**

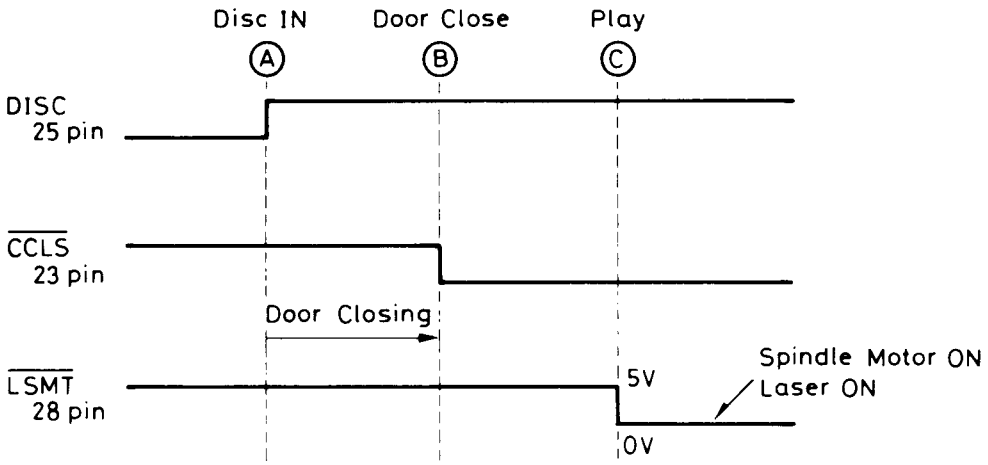



**Fig. 2 Time Chart of IC pins**

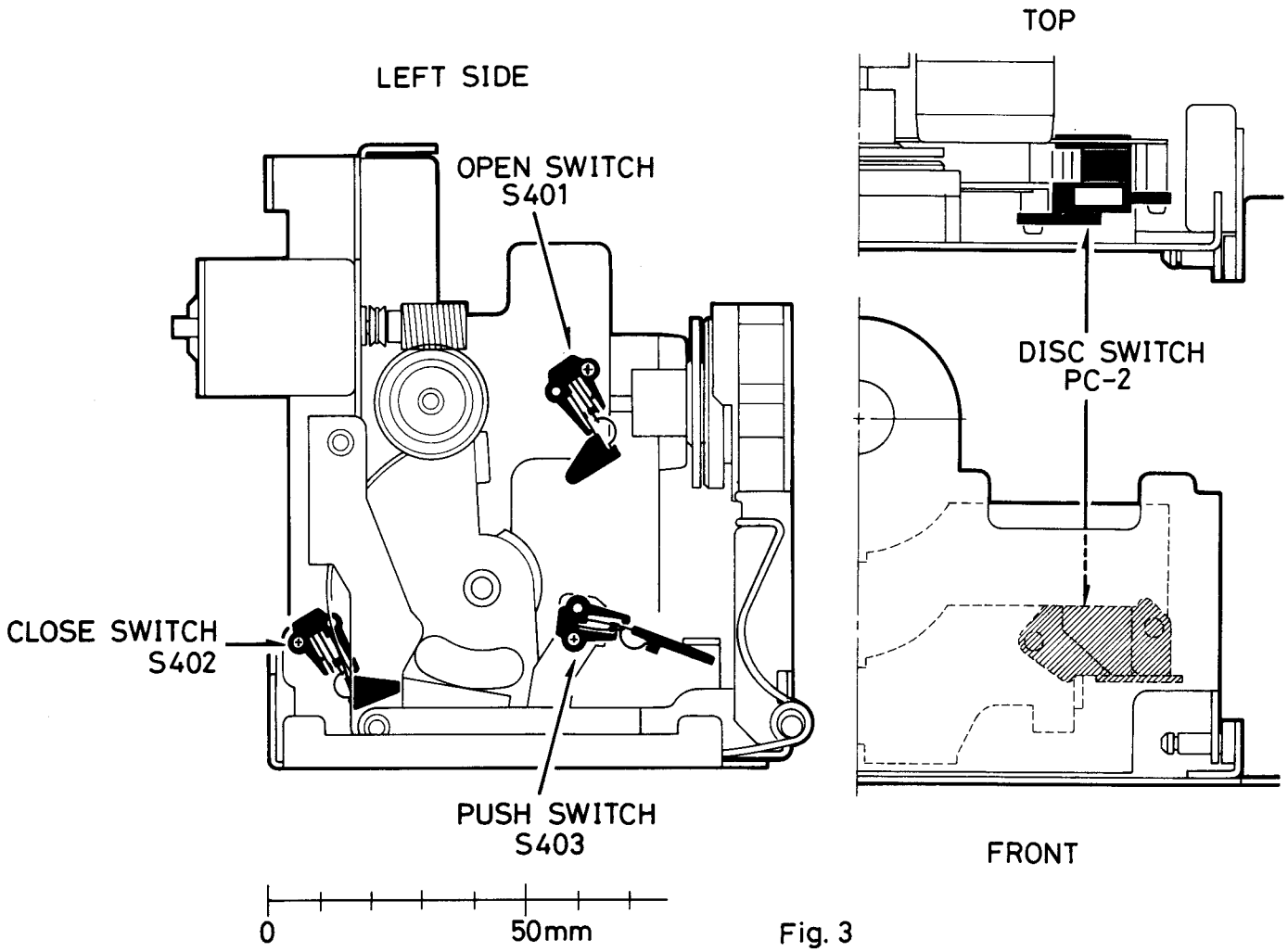



Fig. 3

**Explanation of Fig. 1 (IC401 : microcomputer IC)**

$\overline{\text{CCLS}}$ (23–pin): Indicates whether or not the disc holder is completely closed. (LOW active)

DISC (25–pin) : Indicates whether or not a compact disc is in the disc holder. (HIGH active)

$\overline{\text{LSMT}}$ (28–pin) : Emits a signal to switch the spindle motor and the laser ON. (LOW active)

$\overline{\text{LMOPN}}$ (31–pin) : Rotates the loading motor in the direction to open the disc holder. (LOW active)

$\overline{\text{LMCLS}}$ (32–pin) : Rotates the loading motor in the direction to close the disc holder. (LOW active)

**EXPLANATION OF OPERATION**

1. First, it will be presumed that the disc holder is open, but the compact disc is not in it.
2. When a compact disc is inserted into the disc holder, the light beam from the photo-interrupt (PC-2) LED in Fig. 1 is interrupted.
   Because of this interruption, current stops flowing to the photo-transistor of the photo-interrupt (PC-2).
   As a result, the DISC terminal (25-pin) of IC401 becomes " H " (HIGH). (Fig. 2-A)
3. When the compact disc is set, the $\overline{\text{LMCLS}}$ terminal (32-pin) of IC401 becomes " L " (LOW).
   ($\overline{\text{LMOPN}}$ of IC401 remains " H ".)
   As a result, the loading motor rotates and the disc holder begins closing.
   When the disc holder closes, the door-close switch (S402) switches ON.
   The $\overline{\text{CCLS}}$ terminal (23-pin) of IC401 becomes " L " . (Fig. 2-B)
4. Then, when a key switch (PLAY, PAUSE, F REV, F FWD, BACK ACCESS or FWD ACCESS) is pressed, the LSMT terminal (28-pin) of IC401 outputs an "L" signal.
   Then the spindle motor is rotated, and the laser beam is emitted from the pickup. (Fig. 2–C).

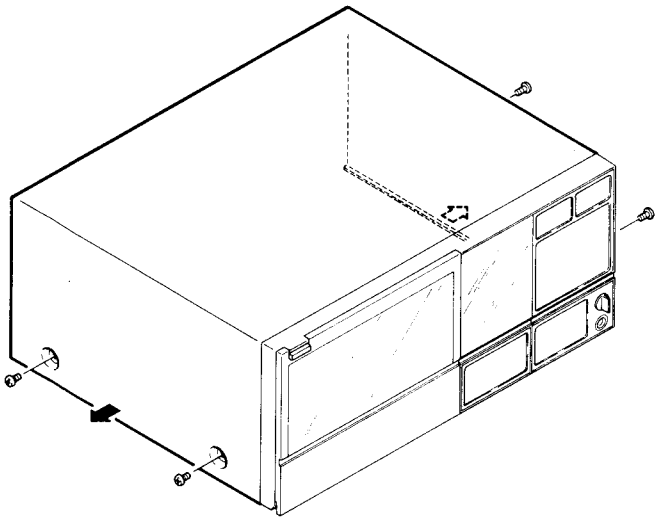
**Summary**

A. A compact disc is loaded.
B. The disc holder is completely closed.
C. One of the key switches (PLAY, PAUSE, F REV, F FWD, BACK ACCESS or FWD ACCESS) is pressed.

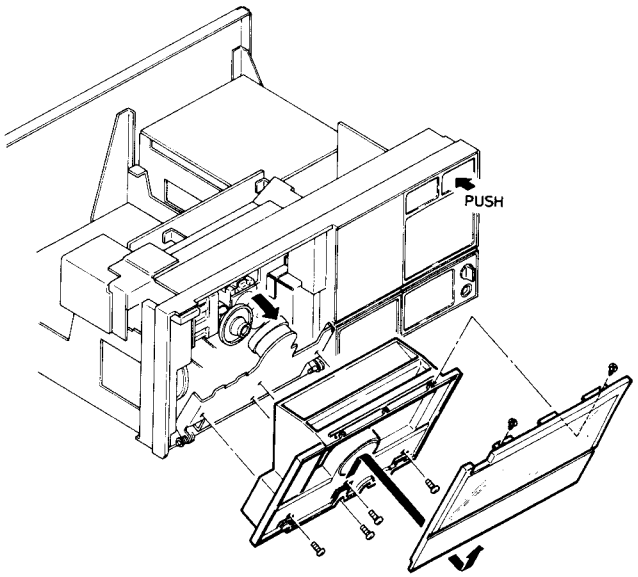
The laser beam will not be emitted from the pickup unless all three conditions (A, B, C) are satisfied.

## 6. HOW TO DISASSEMBLE THE UNIT

### REMOVAL OF CABINET

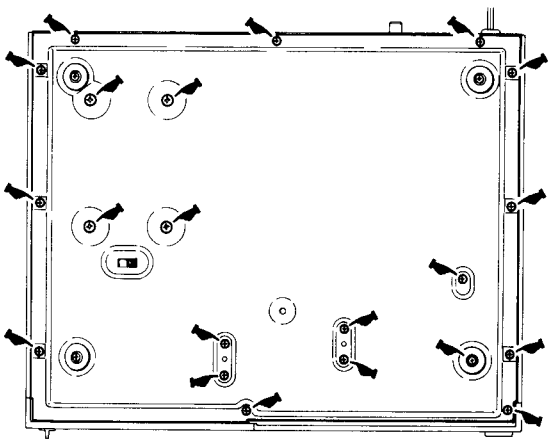


### REMOVAL OF DISC COVER

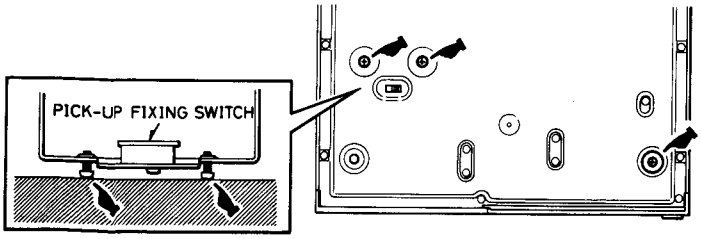



(1) Switch the POWER switch "ON".
(2) Press the OPEN/CLOSE switch; the disc cover will start to open.
(3) Switch the POWER switch "OFF".
(4) Remove the screws holding the disc cover, and lift up the disc cover to remove it.

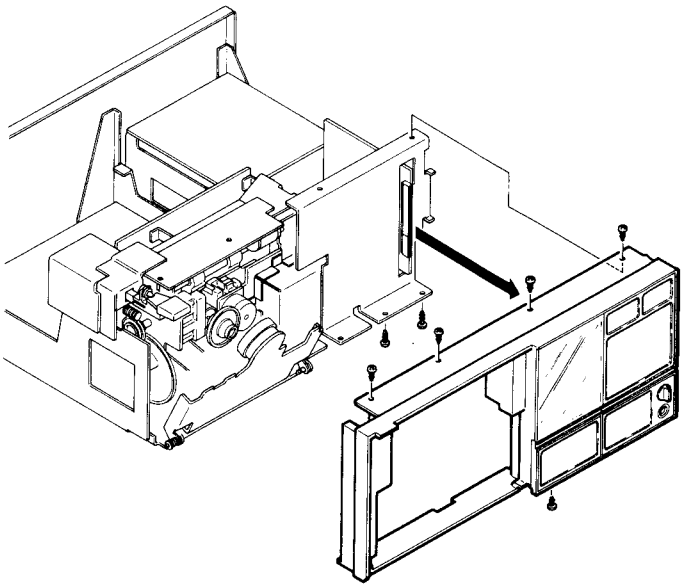
### REMOVAL OF BOTTOM LID



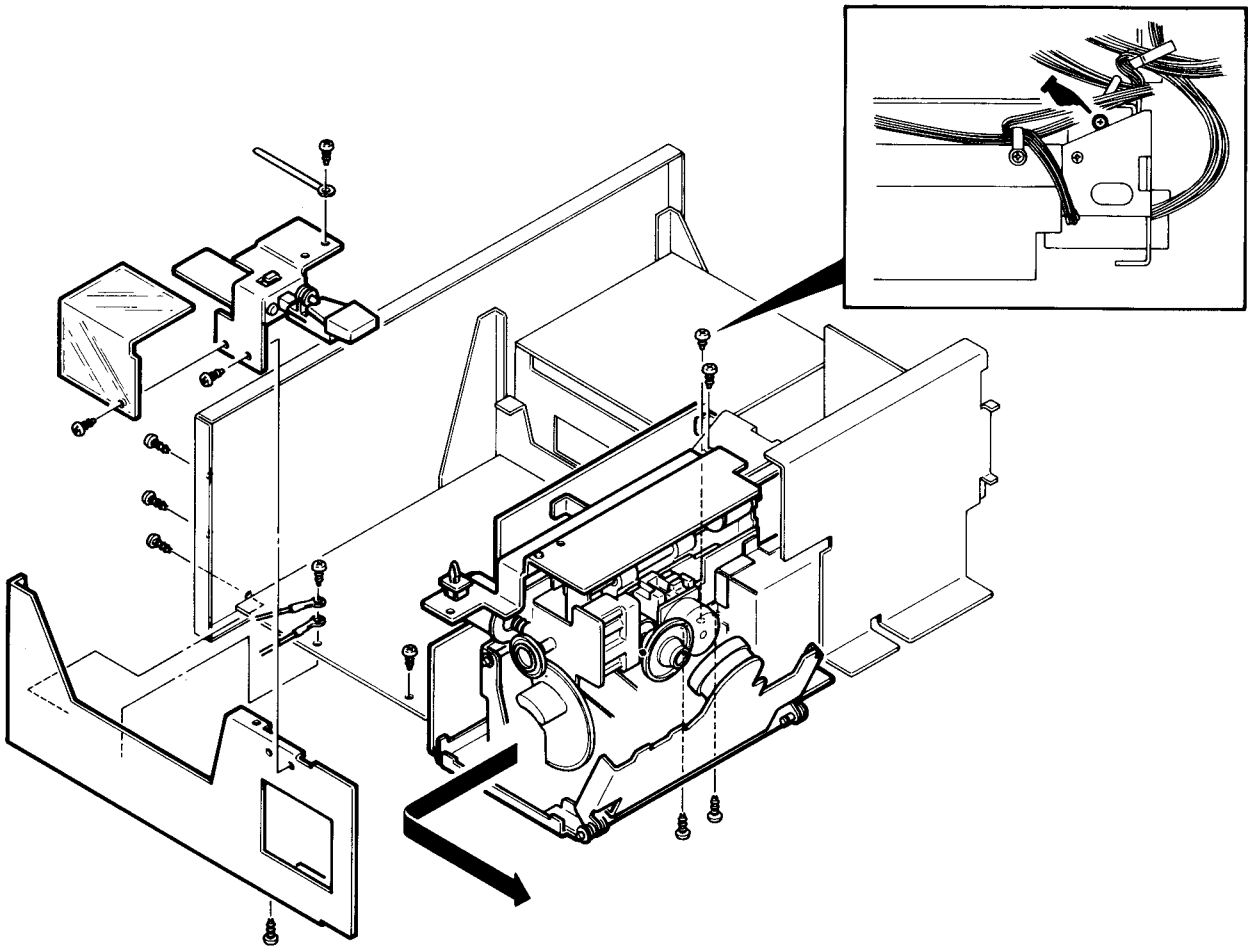
The switch for securing the pick-up projects, and thus must be protected if the bottom cover is removed.
As shown in the figure, protect it by using the screws and a stand before turning it over.

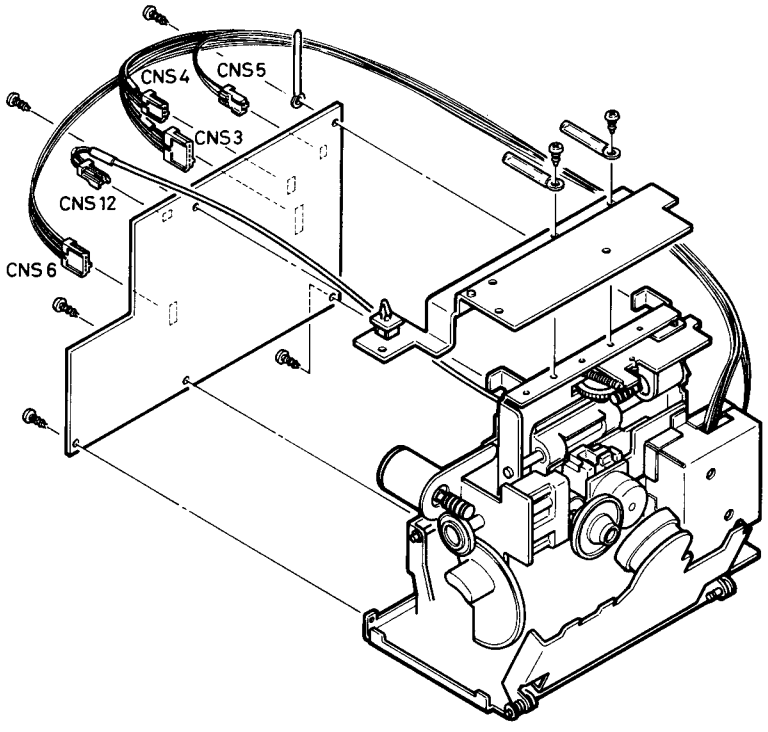



### REMOVAL OF FRONT PANEL

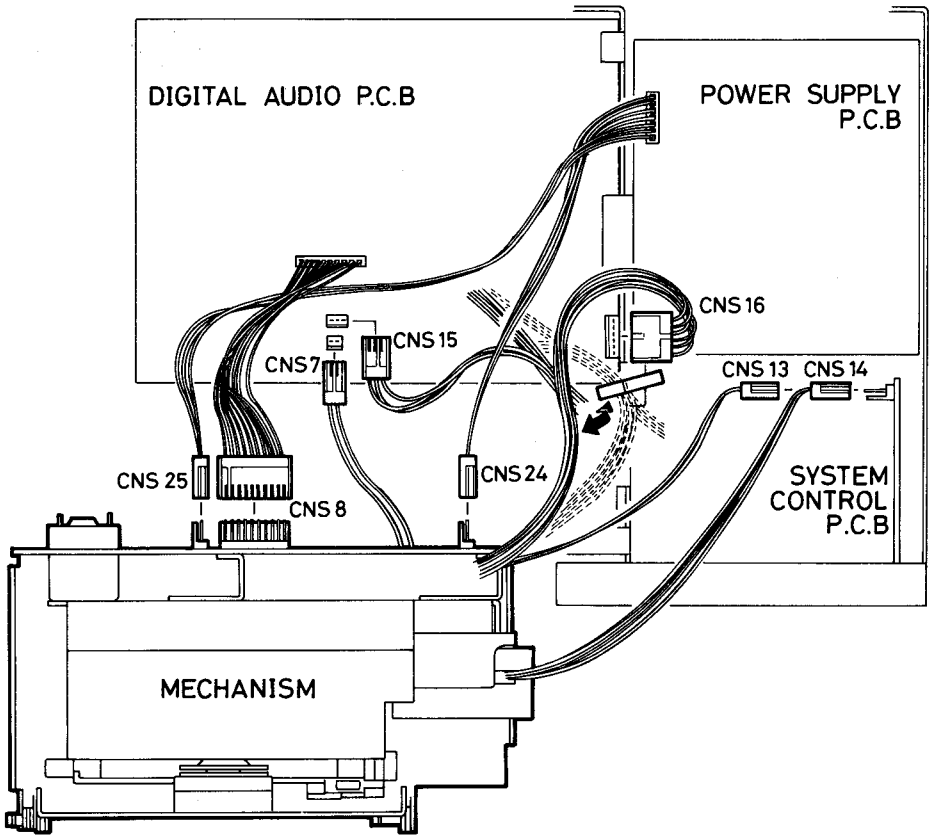


## REMOVAL OF MECHANISM

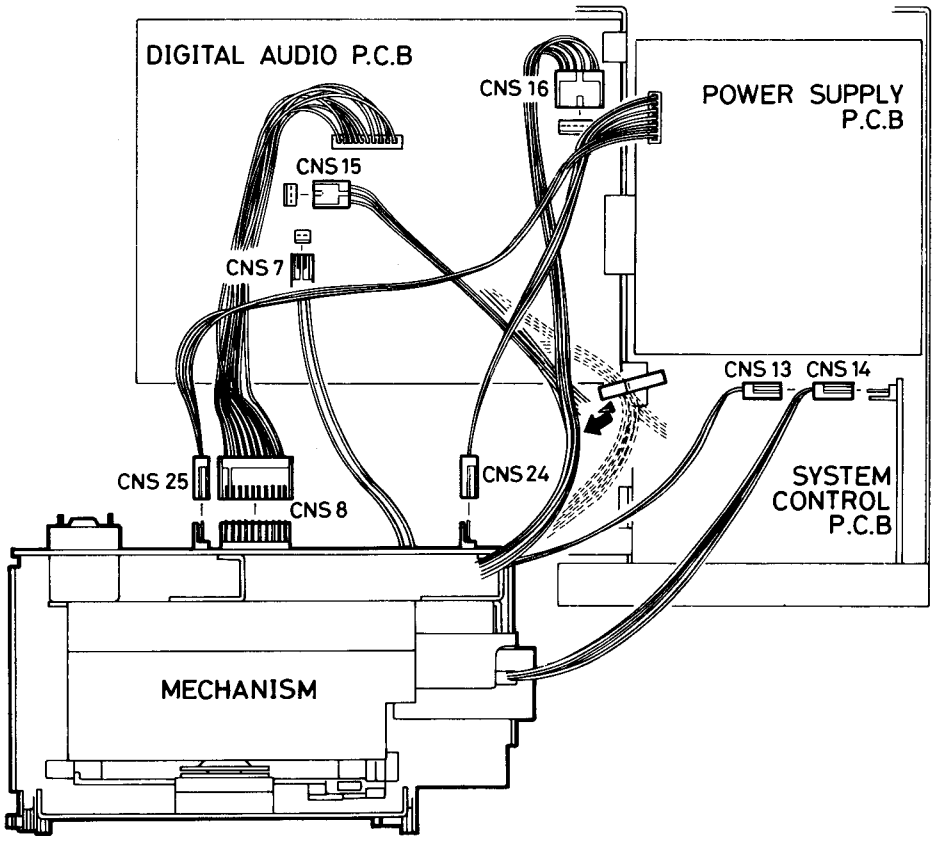




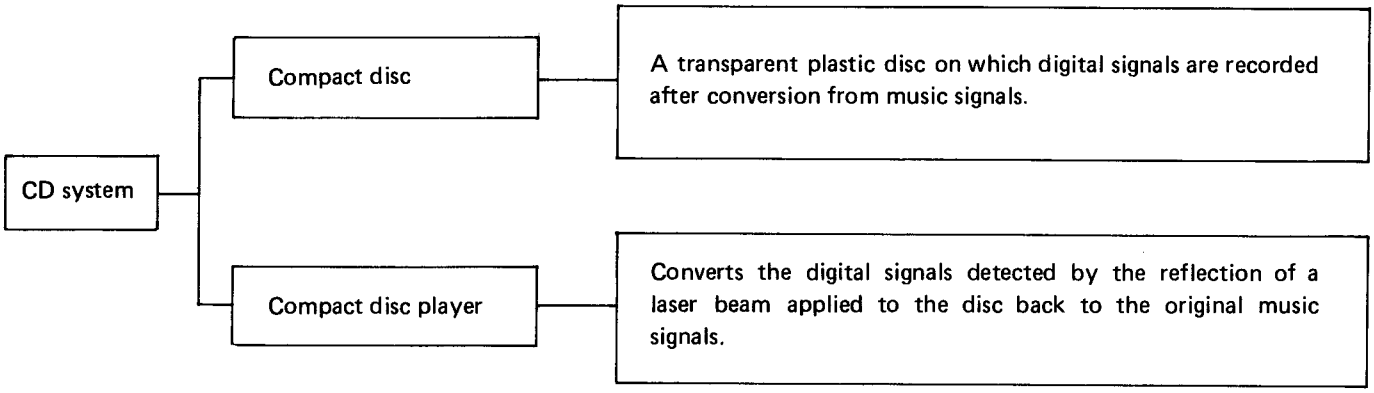
**REMOVAL OF MECHANISM (CONNECTOR) (1) OLD MODEL**



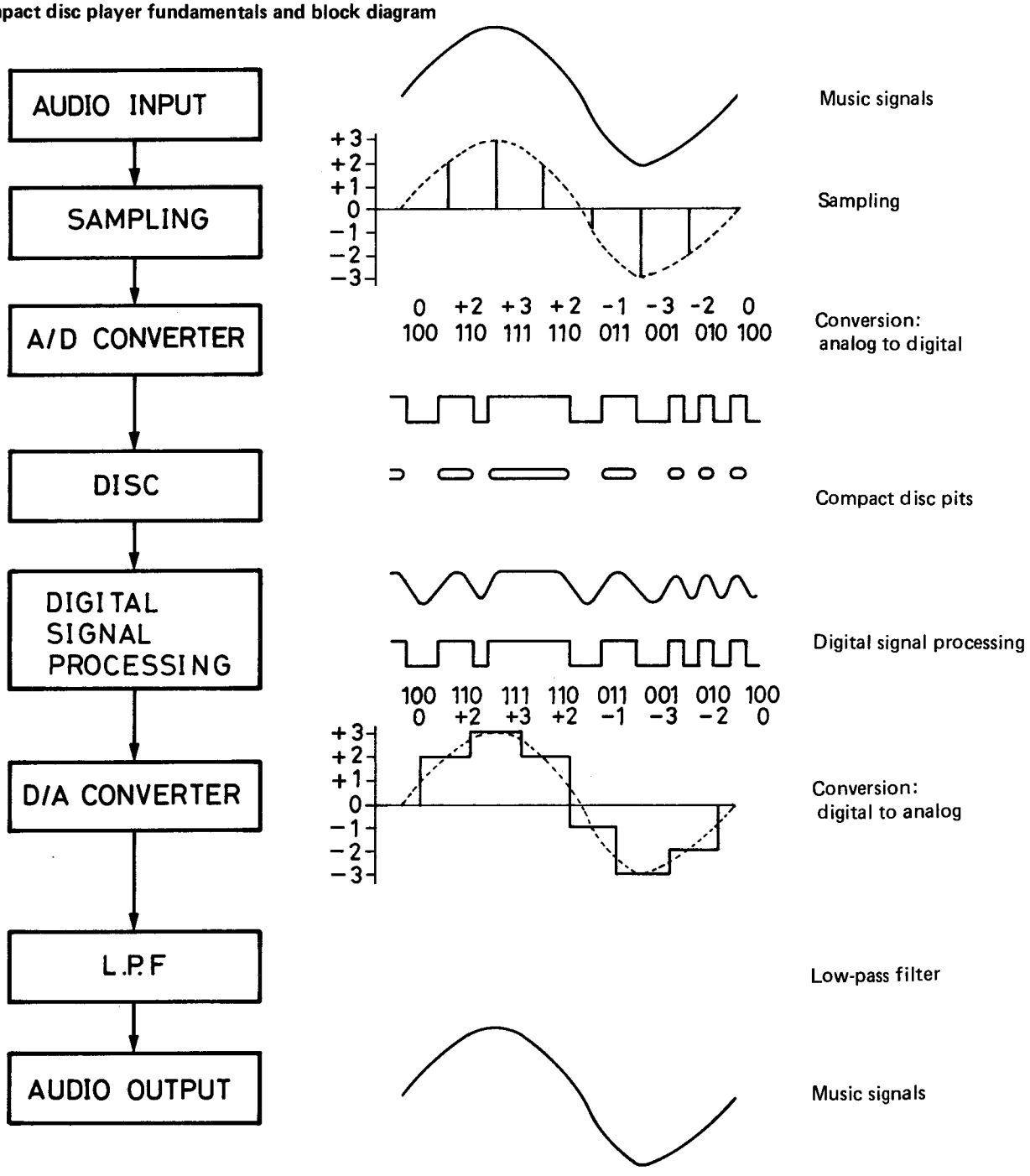

**REMOVAL OF MECHANISM (CONNECTOR) (2) NEW MODEL**

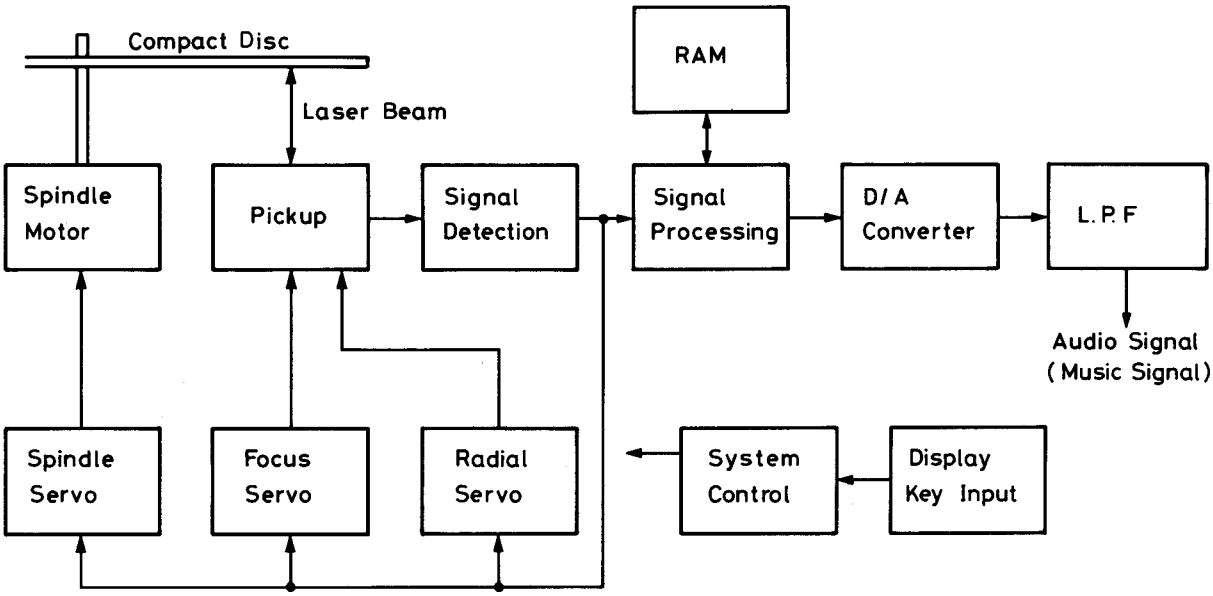


## 7. EXPLANATION OF THE COMPACT DISC (CD) PLAYER SYSTEM


CD system
Compact disc
A transparent plastic disc on which digital signals are recorded after conversion from music signals.
Compact disc player
Converts the digital signals detected by the reflection of a laser beam applied to the disc back to the original music signals.

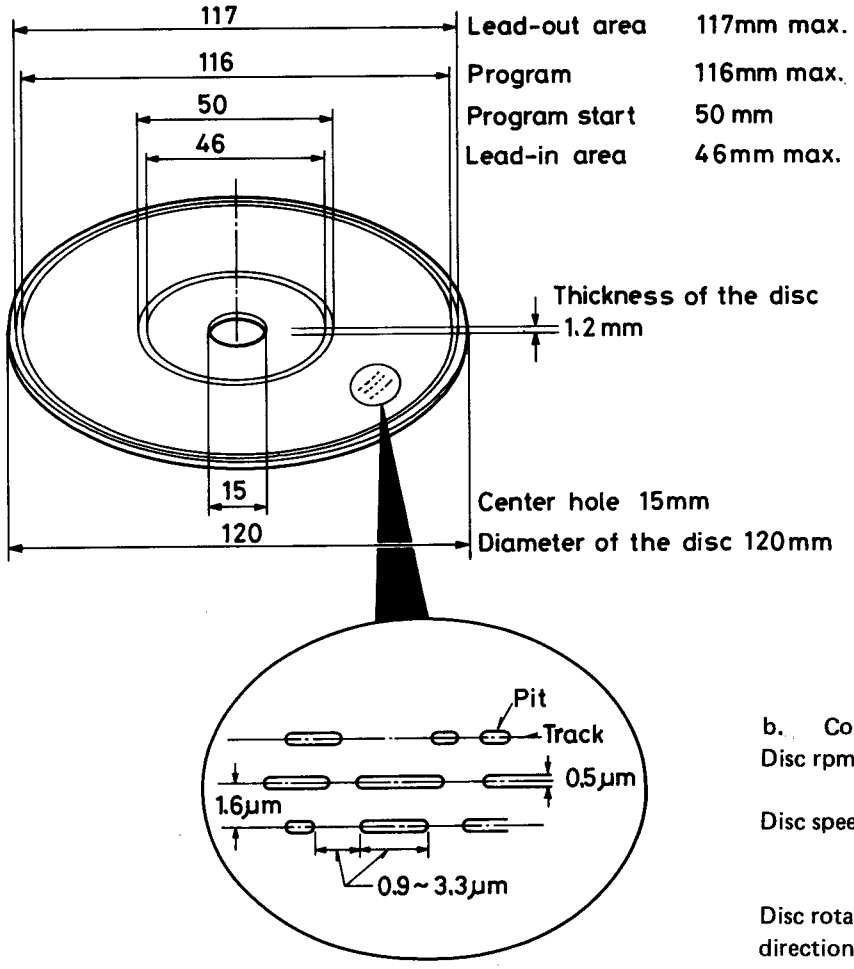
### (1) Compact disc player fundamentals and block diagram






**(2) The compact disc**

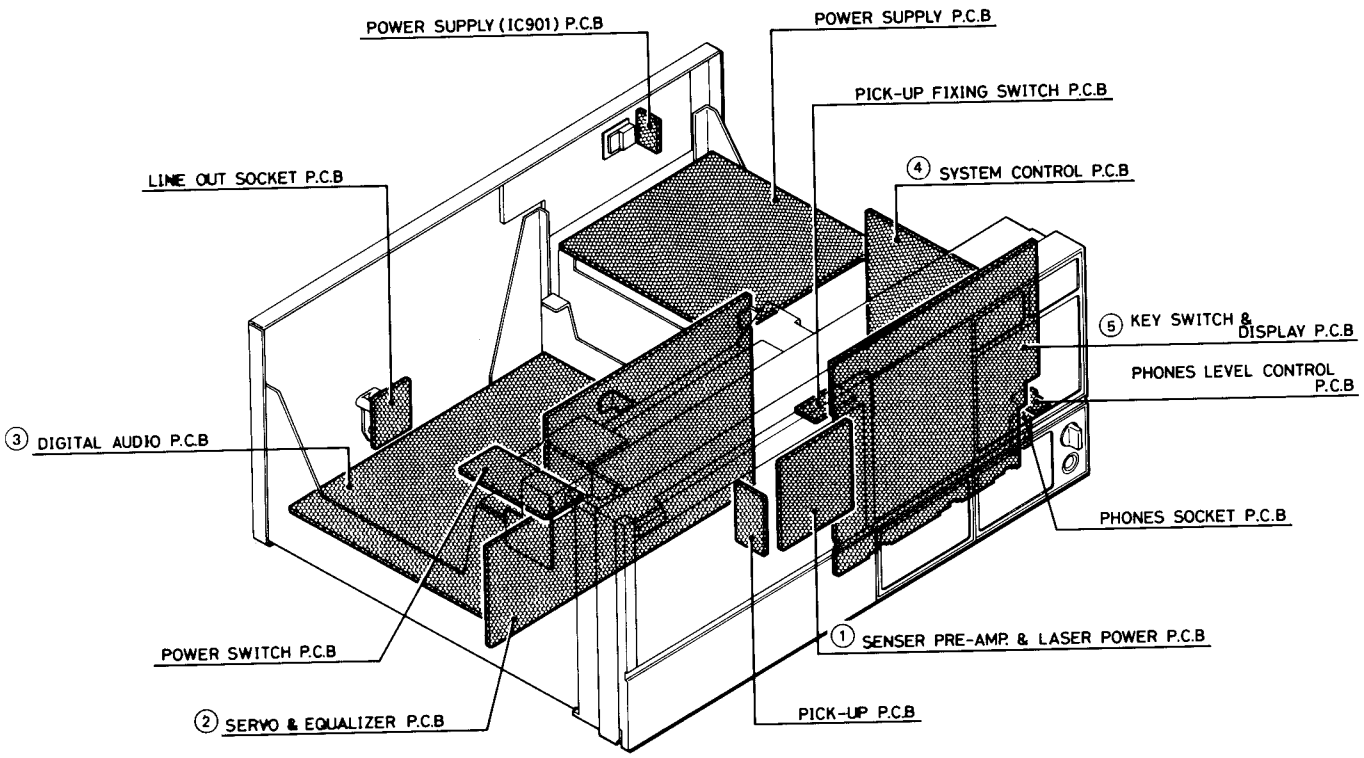
a. Compact disc dimensions




b. Compact disc rotation

| | |
|---|---|
| Disc rpm: | Approx. 500 ~ 200 rpm (inner track ~ outer track) |
| Disc speed: | 1.2 ~ 1.4 m/sec. (normally 1.25 m/sec.) CLV (Constant Linear Velocity) |
| Disc rotation direction: | Counterclockwise (read-out side) |

### (3) Compact disc player printed-circuit boards


POWER SUPPLY (IC901) P.C.B
POWER SUPPLY P.C.B
PICK-UP FIXING SWITCH P.C.B
LINE OUT SOCKET P.C.B
④ SYSTEM CONTROL P.C.B
⑤ KEY SWITCH & DISPLAY P.C.B
PHONES LEVEL CONTROL P.C.B
③ DIGITAL AUDIO P.C.B
PHONES SOCKET P.C.B
① SENSER PRE-AMP. & LASER POWER P.C.B
POWER SWITCH P.C.B
② SERVO & EQUALIZER P.C.B
PICK-UP P.C.B

① Senser pre-amp. & Laser power board
Power supply to laser diode of pickup and circuit for amplification of signal from pickup sensor.

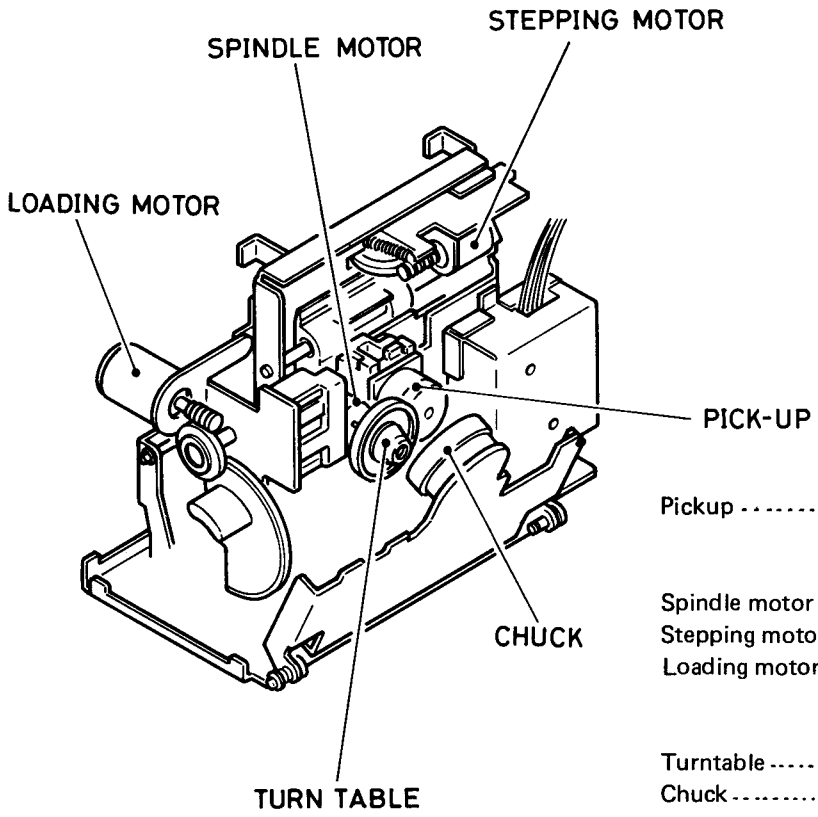
② Servo & Equalizer board
(a) Focus servo – – – – – Adjust distance (focus) of lens (in pickup) from disc surface.
(b) Radial servo – – – – – (Tracking servo) Moves lens (in pickup) to adjust it to 90° angle with disc tracks, so that lens is focused on the pits.
(c) Spindle motor driving
(d) Equalizer & comparator

③ Digital audio board
(a) Spindle servo – – – – – Controls rpm of spindle •motor (for disc rotation) to constant linear velocity.
(b) Analyzes all information recorded on the disc and converts it back to the original signals.

④ System control board.
Microcomputer responds to each operation of the key switch.
Memorizes programs, making program play possible.

⑤ Key switch display board.
Receives and displays the operation mode and transmits the signal to the system-control board.

**(4) Compact disc player mechanism**




Pickup ..... Transmits the laser beam to the disc surface; digital signals on the disc are read out by the reflected beam.
Spindle motor ..... Rotates the turntable.
Stepping motor ..... Rotated by pulses, it moves the pickup.
Loading motor ..... Rotated by the pressing of the OPEN/CLOSE key, it opens and closes the disc holder.
Turntable ..... Holds the disc.
Chuck ..... Secures the disc to the turntable.

## 8. REPLACEMENT OF PICKUP AND SPINDLE MOTOR

The compact disc player is a precisely constructed instrument. First of all, the angle of the laser beam emitted from the pickup must be at a 90° angle to the disc.
If an error occurs in this angle, an error in the angle of the laser beam reflected from the disc surface will also occur, so that the signal cannot be detected and none of the servos (spindle servo, focus servo and radial servo) can operate correctly.
Another important factor is that the spindle motor, which rotates the disc, must rotate smoothly and without eccentricity.
As can be seen then, replacement of the pickup or spindle motor and other parts must be done with great care in order to maintain the original precision, and it is absolutely necessary that adjustments be correctly made after the replacement.

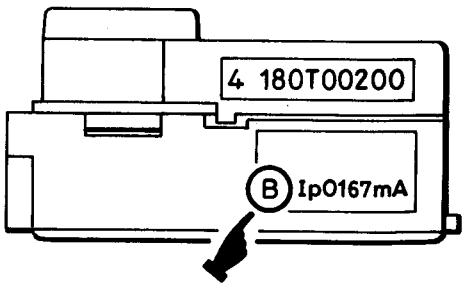
**(1) Preparations**

a. Prepare the measuring instruments and test discs which will be necessary to make adjustments.
(Before attempting to make any adjustments, carefully read the section "Compact Disc Player Adjustments" on page 18.)

b. After the adjustments are completed, be sure to apply a coating of adhesive or screw-lock paint to places where such was previously applied.

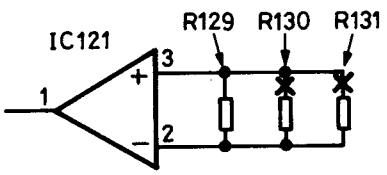
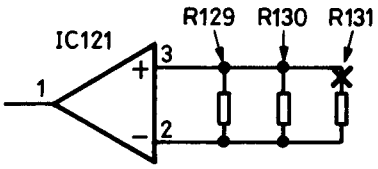
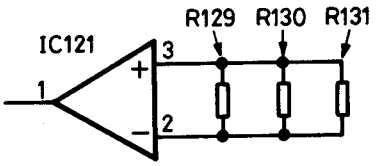
**(2) Pickup replacement**

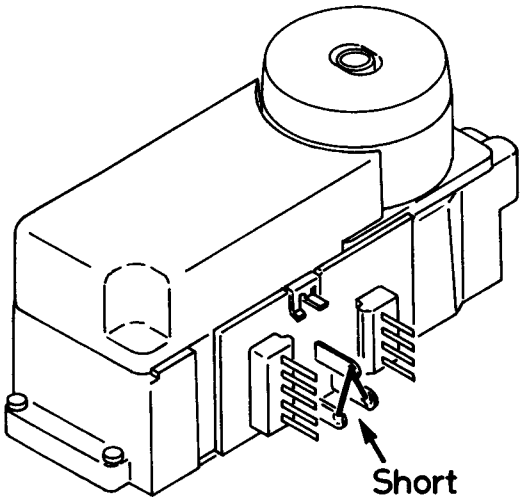
There are three ranks of pickup: A, B and C.
Be sure to replace the pickup with one of the same rank.
If the pickup is for any reason replaced by one of another rank, the following procedure will be necessary.




Pickup rank indication

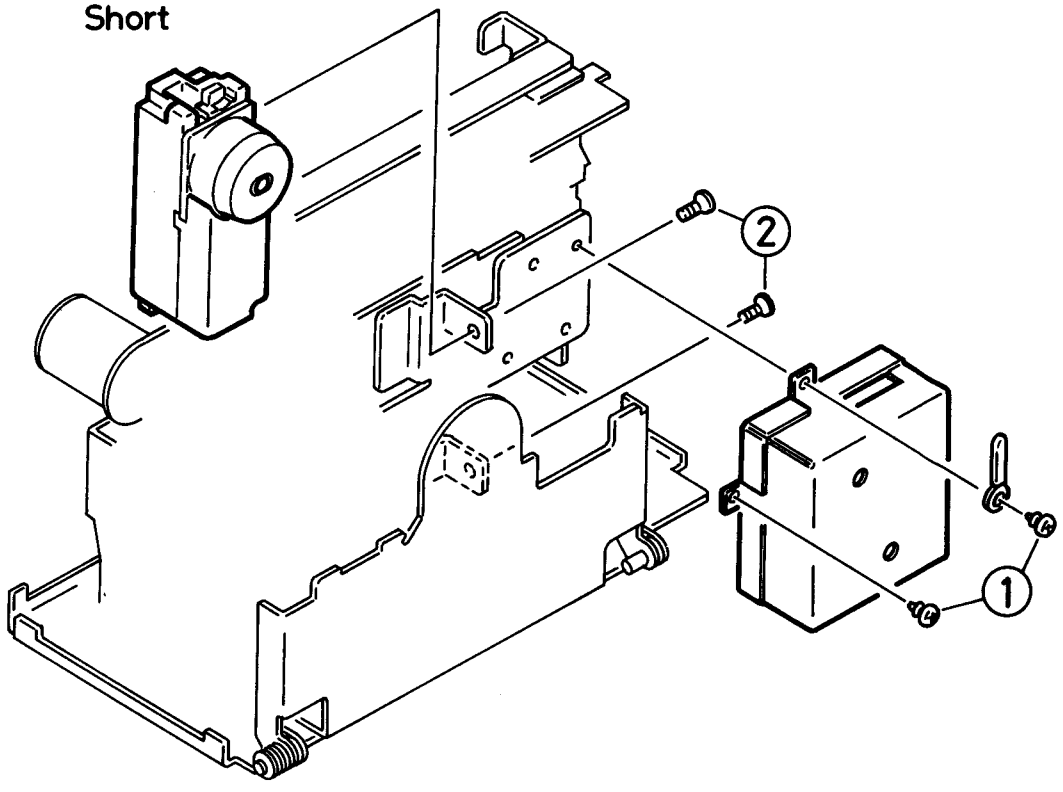
Change the resistance of the sensor preamp/laser power board in accordance with the pickup rank, as indicated below.

| A RANK | B RANK | C RANK |
|---|---|---|
|  |  |  |
| Cut the legs of the R130 and R131 resistors. | Connect the legs of the R130 resistor. Cut the legs of the R131 resistor. | Connect the legs of the R130 and R131 resistors. |



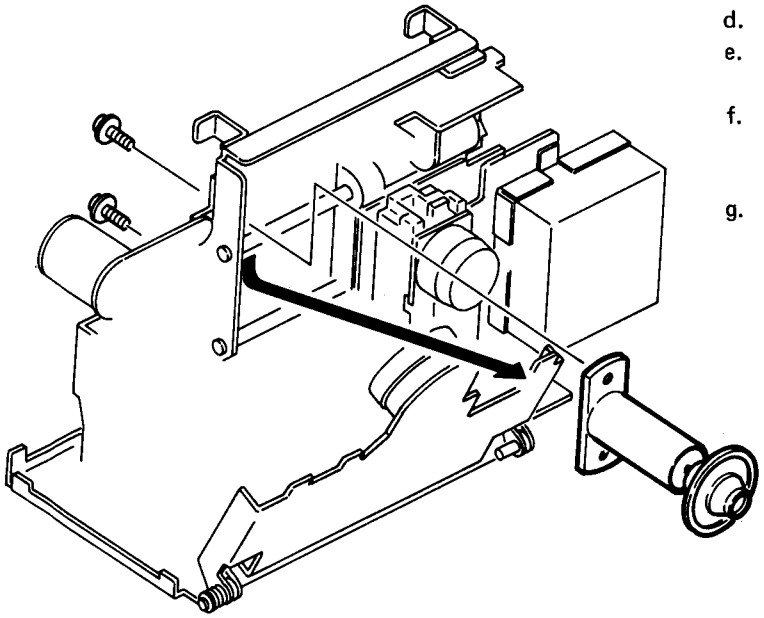

When replacing the pickup, first short circuit the laser diode terminals by using a lead wire, and then solder.
If there is no malfunction of the pickup, damage caused by static electricity can be prevented.

Short the terminals on the laser diode.

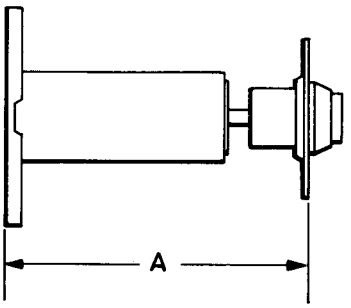


### (3) Spindle motor replacement

a. Remove the spindle motor from the mechanism.
b. Measure and make a note of the dimension indicated as A in the figure. (This will be A1.)

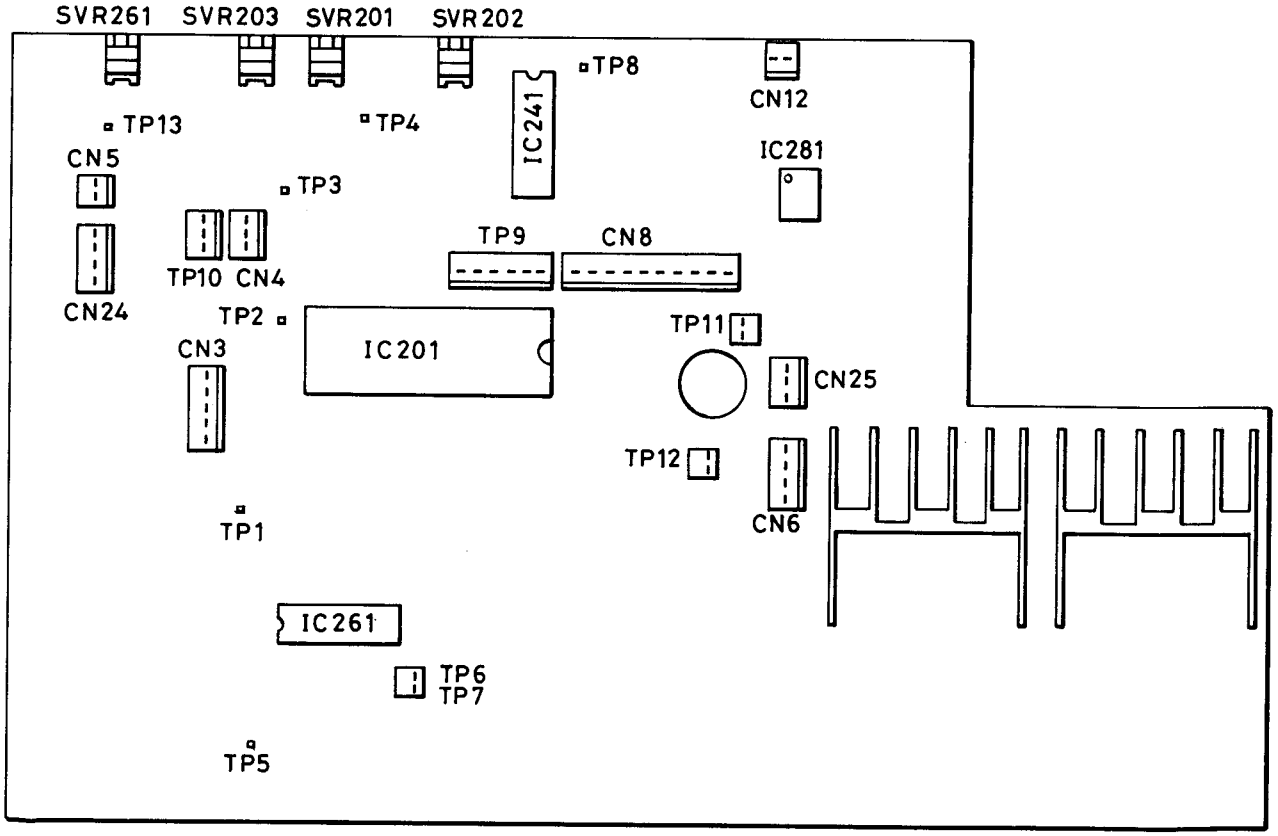


c. Completely turn the height adjustment screw at the rear of the spindle motor clockwise.
Then measure and make a note of the dimension indicated as A in the figure under this condition. (This will be A2.)
d. Remove the old spindle motor from the turntable.
e. Completely turn the height adjustment screw at the rear of the new spindle motor clockwise.
f. Attach the new spindle motor to the turntable.
Then make an adjustment so that dimension A is the same as A2 measured in step (c.).
g. Turn the height adjustment screw at the rear of the new spindle motor so that its dimension is the same as A1 measured in step (b.).

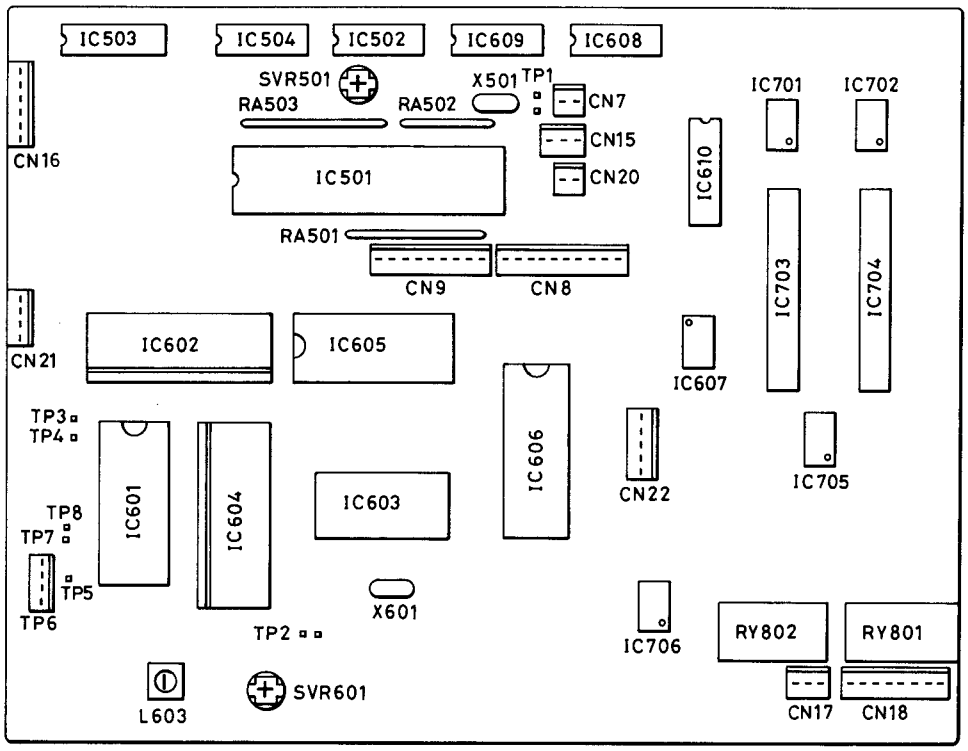



Referenc value (61.0±0.5 mm)

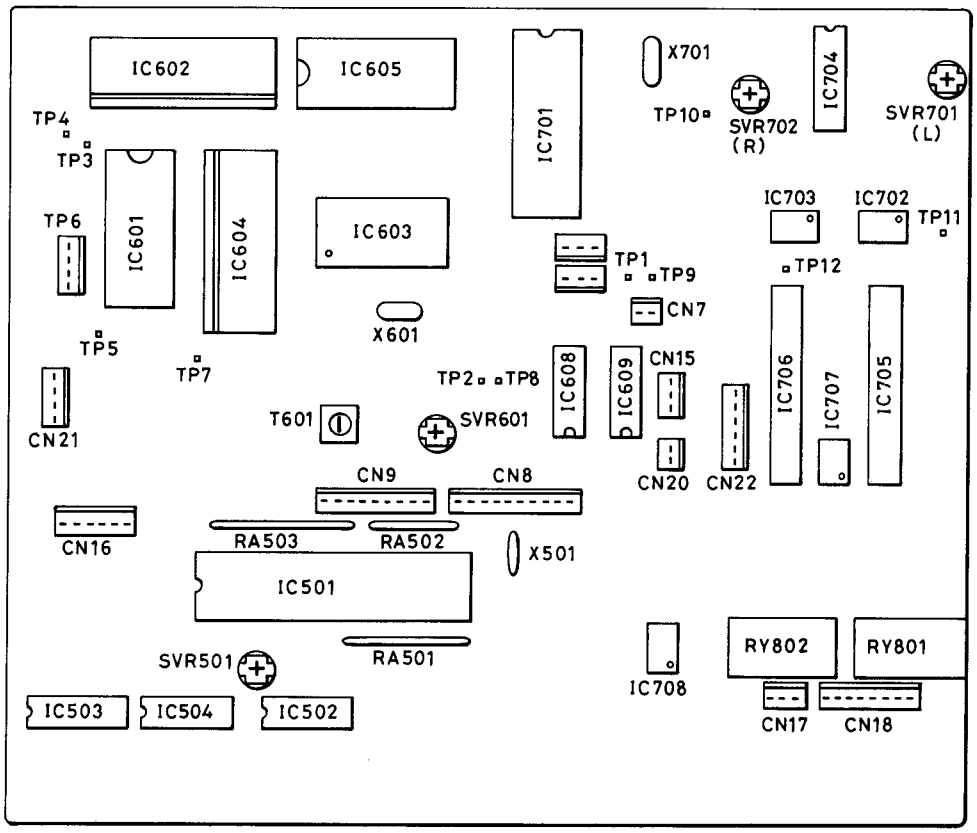
## 9. PARTS LOCATION




Servo & Equalizer P.C.B




Digital Audio P.C.B (OLD)




Digital Audio P.C.B (NEW)

## 10. COMPACT DISC PLAYER ADJUSTMENTS

Up to this point, we have explained the handling of the compact disc player, precautions before servicing, handling of the pickup, how to disassemble the unit, an outline of the system, etc. Be sure to read those sections carefully before attempting to make any adjustments. The following sections are explanations of procedures to be followed for making adjustments of the compact disc player.

| Step | Adjustment |
|---|---|
| 1. | Adjustment of laser power. |
| 2. | Adjustment of skew. |
| 3. | Adjustment of turntable height. |
| 4. | Adjustment of preamplifier gain. |
| 5. | Adjustment of EFM (comparator level). |
| 6. | Adjustment of PLL. |
| 7. | Adjustment of radial gain. |
| 8. | Adjustment of focus offset. |
| 9. | Adjustment of focus gain. |
| 10. | Checking RE (radial error) voltage and following voltage |
| 11. | Adjustment of pause. |
| 12. | Adjustment of audio offset. |
| 13. | Checking adjustments and minor adjustments. |

**A. If pickup is replaced**

a. All adjustments must be made in the order shown above.

b. The adjustment of the laser power in step 1. must be made very carefully, and, because the adjustment of skew in step 2. is the basis of subsequent adjustments, it must be made with extreme care.

**B. If the pickup is not replaced**

a. if operation is not normal. make readjustments of steps 3. to 13.

b. When any adjustment is made, all subsequent items in the listed order must be readjusted.
(If, for example, the PLL adjustment in step 6 is made, items 7 ~ 13 must be readjusted.)

c. When the pickup is not replaced, it is generally not necessary to make the skew adjustment. If, however, the eye pattern of the HF signal is not open, the skew adjustment should be made.
(Eye pattern: page 22, b of Fig. C.)

**C. Other**

a. Although the connection jig described in the specifications in not absolutely necessary in order to make the adjustment, its use is recommended in order to make the adjustment easier.

b. Refer to page 30 for information concerning checking of the adjustments and minor adjustments.

c. Use a probe when using an oscilloscope, memory scope or digital voltmeter to view the signal. For grounding at that time, use the probe ground at the ground point closest to the signal.

## INSTRUMENTS REQUIRED FOR ADJUSTMENTS

| Item | Model and manufacturer | |
|---|---|---|
| Laser power meter | ML96A (MA911A sensor, processed item) | (ANRITSU) |
| Memory scope | DSS6521 (storage scope) | (KIKUSUI) |
| Oscilloscope | SS5711 (100 MHz) | (IWATSU) |
| AC digital voltmeter | Multch Meter | |
| DC digital voltmeter | Multch Meter | |
| DC power supply | ( 0 ~ +5V, 1A) | |

Note: Adjustments are possible by using equipment from other manufactures if their performance corresponds to that shown above.

## TEST DISCS REQUIRED FOR ADJUSTMENTS

| No. | Item | Description and manufacture | |
|---|---|---|---|
| No. 1 | 800 104–2 | DEMO. DISC | (Poly Gram) |
| No. 2 | YEDS 3 | TEST CD. TYPE 2 | (SONY) |
| No. 3 | Eccentricity disc | Eccentricity width : 200μm | |
| No. 4 | Surface oscillation disc | Oscillation width : +400μm | |
| No. 5 | Scratch disc | Black spot width (Black spot disc) : 300μm | |
| No. 6 | YEDS 2 | TEST C.D. TYPE 1 | (SONY) |

Note: These discs may be changed without prior notice.

**(1) Adjustment of laser power**

a. As shown in Fig. A, remove the cabinet, bottom lid, disc cover, front panel, and reinforcement.

b. As shown in Fig. A, connect the connector of the key switch & display board (front panel) and the system-control board (main unit) by the connection jig (AJ-001).

**Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin etc.**

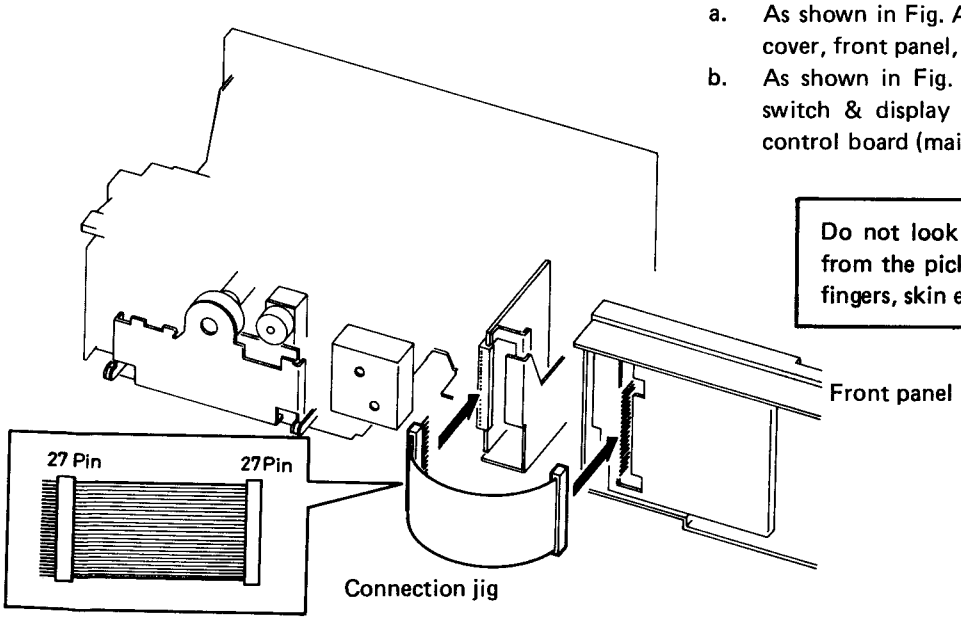



Fig - A

c. As shown in Fig. B, semi-fixed resistor SVR121 for laser power adjustment should be turned ahead of time completely counterclockwise (Note 1).

d. Switch on the power. (The pickup will move to the lead-in position.)

e. As shown in Fig. C, the gear part of the stepping motor is to be freed and moved to a position at which the pickup can be easily measured.

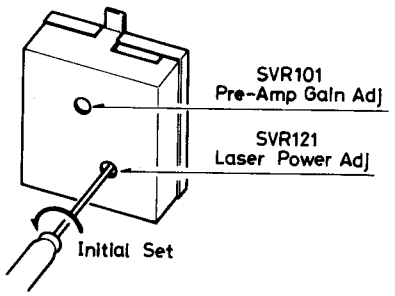



Fig-B

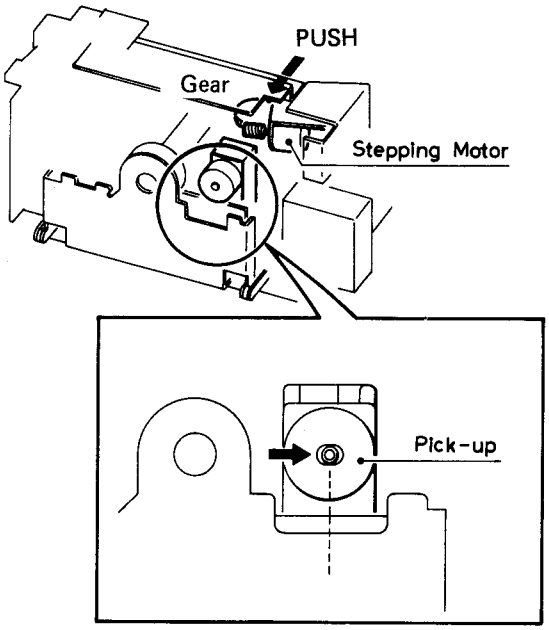



Fig-C

f. As shown in Fig. D, use a flat-tip screwdriver to interrupt the disc sensor beam, thus causing detection.

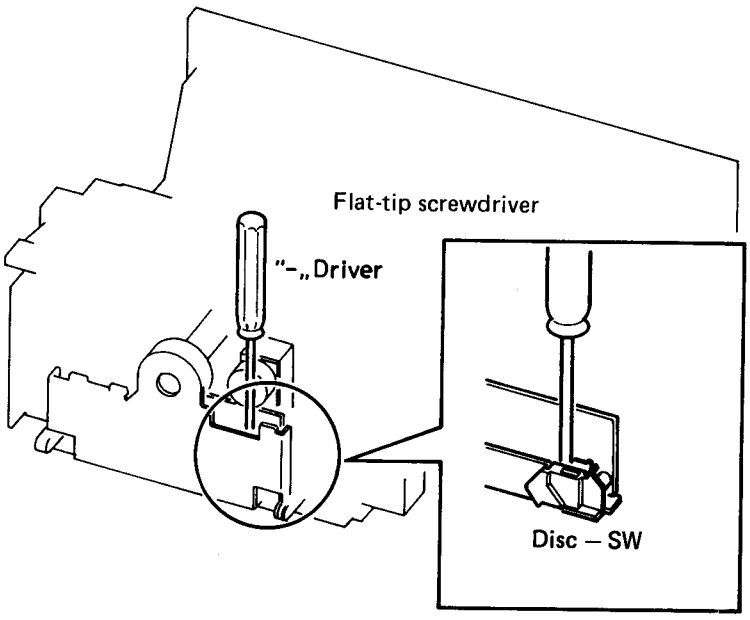
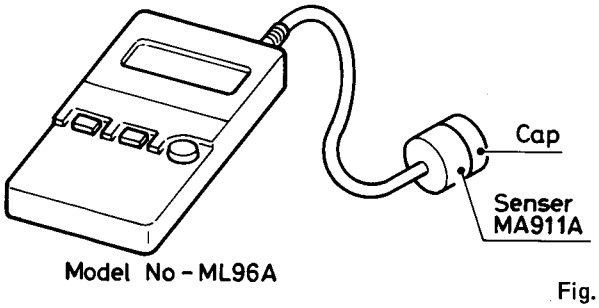



Fig-D

**Laser Power Meter Zero Adjust**




Model No - ML96A

Fig. –E

Press the play switch only after the laser power meter sensor has been perfectly aligned with the laser output section of the pickup.

OPTICAL POWER METER

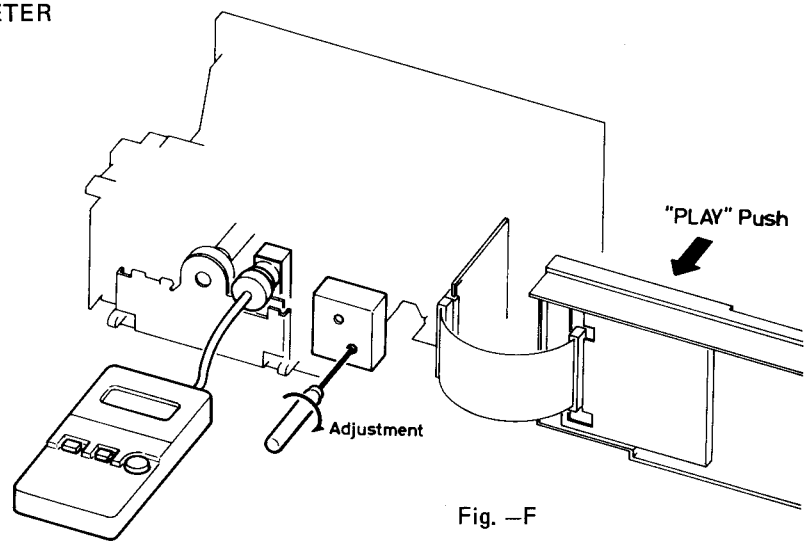



Fig. –F

g. As shown in Fig. E, make the zero-point adjustment of the laser power meter sensor, with the cap not removed. (Adjust by turning the zero-set control so that 0.000 mW is indicated.)

h. As shown in Fig. F, remove the cap of the laser power meter, and align the sensor opening and the laser part of the pickup.

i. As shown in Fig. F, press the PLAY switch. The spindle motor will then begin rotating, and the laser part of the pickup will also move.

j. At this time (while the spindle motor and the laser part of the pickup are operating), make the adjustment by slowly and a little at a time turning clockwise SVR121 so that the value shown by the laser power meter becomes 0.286 mW. (Laser beam projection will begin.)

Notes:

1. The semi-conductor laser may be damaged if SVR121 is turned in the reverse (clockwise) direction from its original setting or if it is turned by too great an amount at one time. More than 0.35 mW should not be used, even though it might be possible.
2. Do not touch the laser part of the pickup or allow it to come near the eyes, because doing so might damage the pickup or injure the eyes.
3. There are 3 rank classifications of the pickup: A, B and C. Be sure to check to confirm that the connections of R130 and R131 of the preamplifier & laser power board are correctly made according to the rank of the pickup being used. (See page 15.)
4. For the sensor of the laser power meter, one with an expanded detection port should be used. If one that does not have an expanded port is used, it might strike the pickup lens and damage the pickup.
5. When making the adjustments in item (i.) and item (j)., the operation of the spindle motor and the pickup laser part will stop after a few seconds. Each time they stop while the adjustments are being made, press the PLAY switch and then make the adjustment.
6. Use ML96A as the laser power meter. If any other meter is used, a compensation adjustment should be made. (With ML96A, 0.3 mW of power is output when the indication is 0.286 mW.)

(2) **Adjustment of skew**

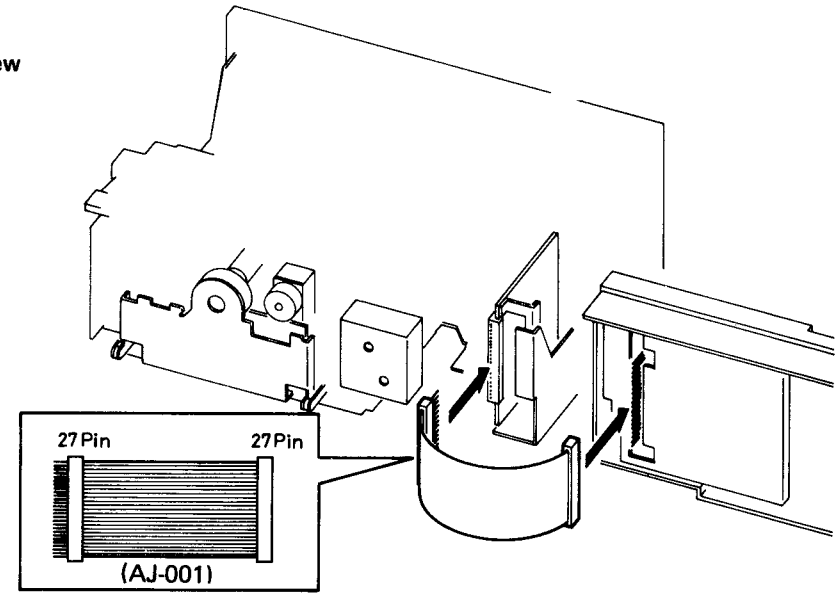



Fig - A

a. As shown in Fig. A, remove the cabinet, bottom lid, disc cover and front panel.
b. As shown in Fig. A, connect the connector of the key switch & display board (front panel) and the system-control board (main unit) by the connection Fig. (AJ-00)
c. As for the focus offset voltage (TP3), before making the adjustment of the skew, adjust SVR201 so that the DC voltage becomes the same for play and for stop.
d. As shown in Fig. B, connect an oscilloscope to TP1 (HF signal) and TP2 (DL signal) of the servo & equalizer board.
e. Switch the power on and set test disc No. 1.
f. As shown in Fig. B, press the PLAY switch and then check to be sure that the HF signal (part "a") is linear and that the eye pattern (part "b") is expanded. (See Fig. C.)
g. If the conditions in step (f.) are not satisfied, adjust tilt-holding screw I (tangential skew) of the pickup plate, as shown in Fig. D, so that the conditions in step (f.) are satisfied.
h. If the adjustment described in step (g.) cannot be made, adjust tilt-holding screw II (radial skew) of the pickup plate, as shown in Fig. D, so that the HF signal amplitude is maximized and the DL signal amplitude is minimized.
i. Repeat the adjustments in steps (g.) and (h.) so that the waveform is as shown in Fig. C.

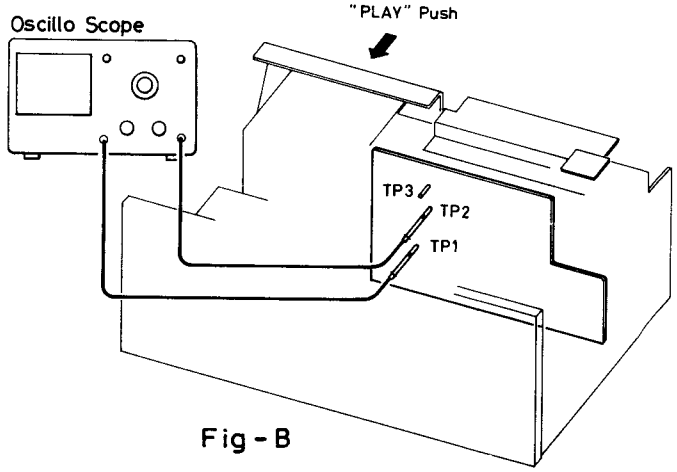
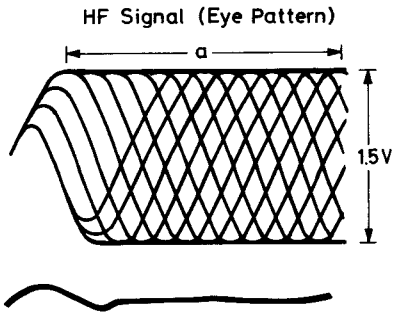



Fig - B



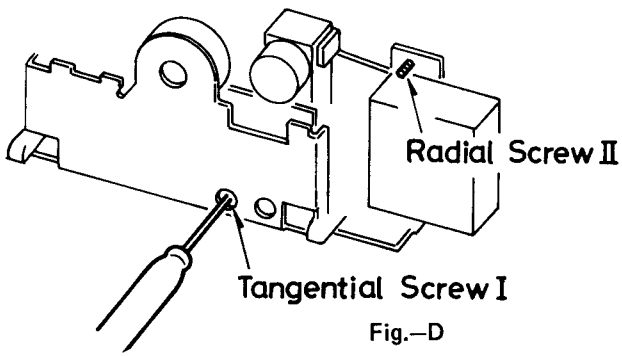




Fig.–D

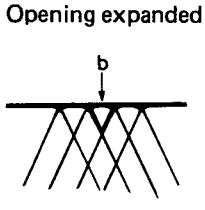
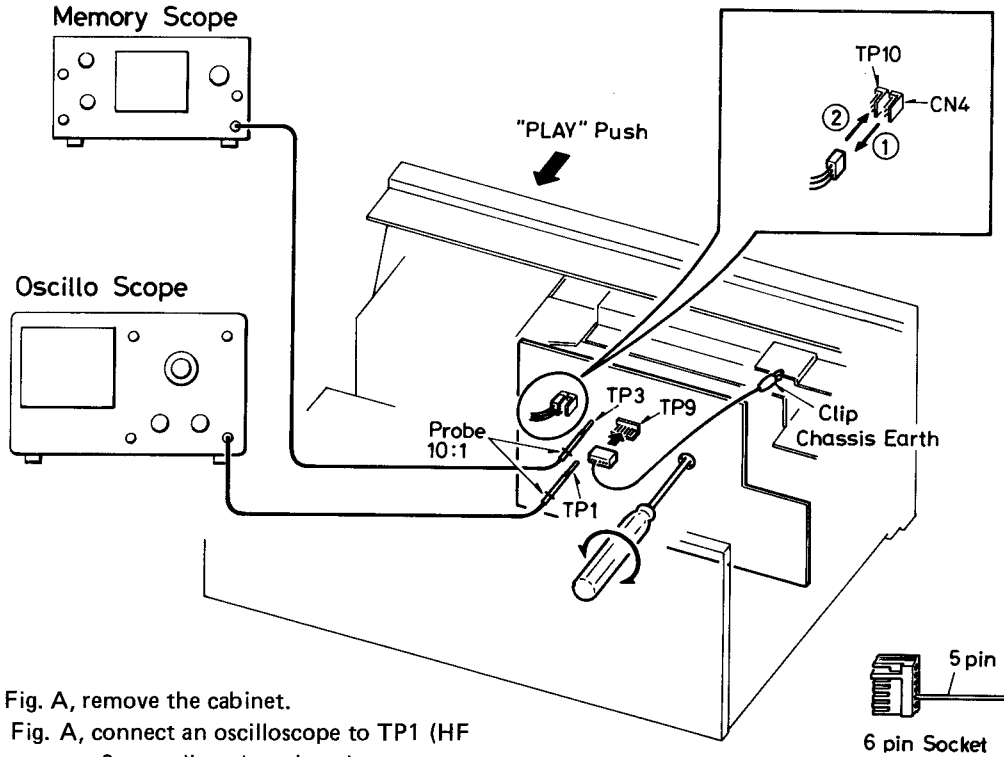
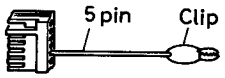



Fig.–C

### (3) Adjustment of turntable height



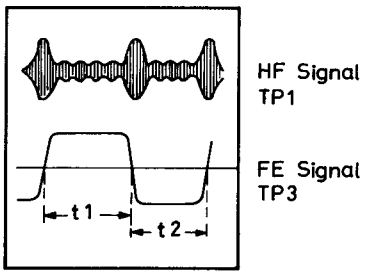



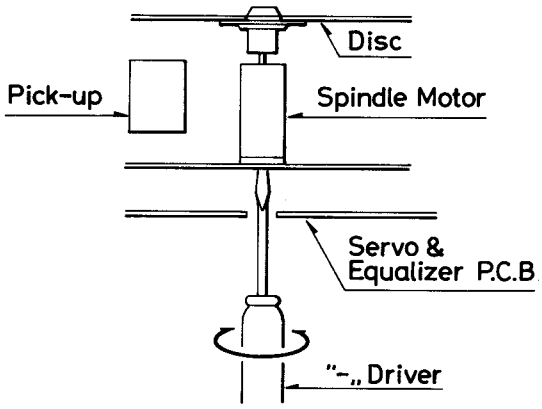

6 pin Socket
(AJ-004)

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, connect an oscilloscope to TP1 (HF signal) of the servo & equalizer board and connect a memoryscope to TP3 (FE signal).

c. As shown in Fig. A, reconnect connector CN4 (3-pin) to the adjacent TP10. (HF.OK (IC201 – 20-pin) forced high) Then set the connection jig (AJ-004) to TP9. The clip from the connection jig (AJ-004) should be connected to the metal part (chassis ground) of the mechanism. (N.HOP/READY (IC201 – 5-pin) forced low)




Flat–tip Screwdriver

d. Switch the power on and prepare test disc No. 2 for play.

e. As shown in Fig. A, press the PLAY switch and, with the HF signal waveform on the oscilloscope screen, adjust the spindle motor shaft, by adjusting the screw on the back of the motor, so that FE signal waveforms t1 and t2 on the memoryscope become the same time (50%duty).

f. Press the OPEN/CLOSE switch and take out the disc. Then insert it once again and press the OPEN/CLOSE switch. (Disc chucking) Then press the PLAY key again, and check to be sure that FE signal waveforms t1 and t2 are the same. Repeat this chucking check 2 or 3 times.

**Notes:**

1. If a memoryscope is not available, an oscilloscope can be used as a substitute but the adjustment will be slightly more difficult.
2. Because rough pitch may result in backlash when the spindle motor shaft adjustment screw is adjusted, the adjustment should be checked after the screwdriver is taken out of the screw.
3. If the signal waveform does not appear, turn the adjustment screw all the way in one direction or the other, and then turn it little by little in the reverse direction and adjust it to the position where the FE signal waveform on the oscilloscope reverts from high to low or low to high.
4. Because the spindle motor will stop every few seconds, press the PLAY switch each time it stops and continue with the adjustment.
5. After the adjustment has been completed, remove the connection jig, and return the TP10 connector to CN4.

(4) **Adjustment of preamplifier gain**

a. As shown in Fig. A, remove the cabinet, disc cover and front panel.

b. As shown in Fig. A, connect the connector of the system-control board and the key switch & display board on the front panel by using the connection jig (AJ-001).

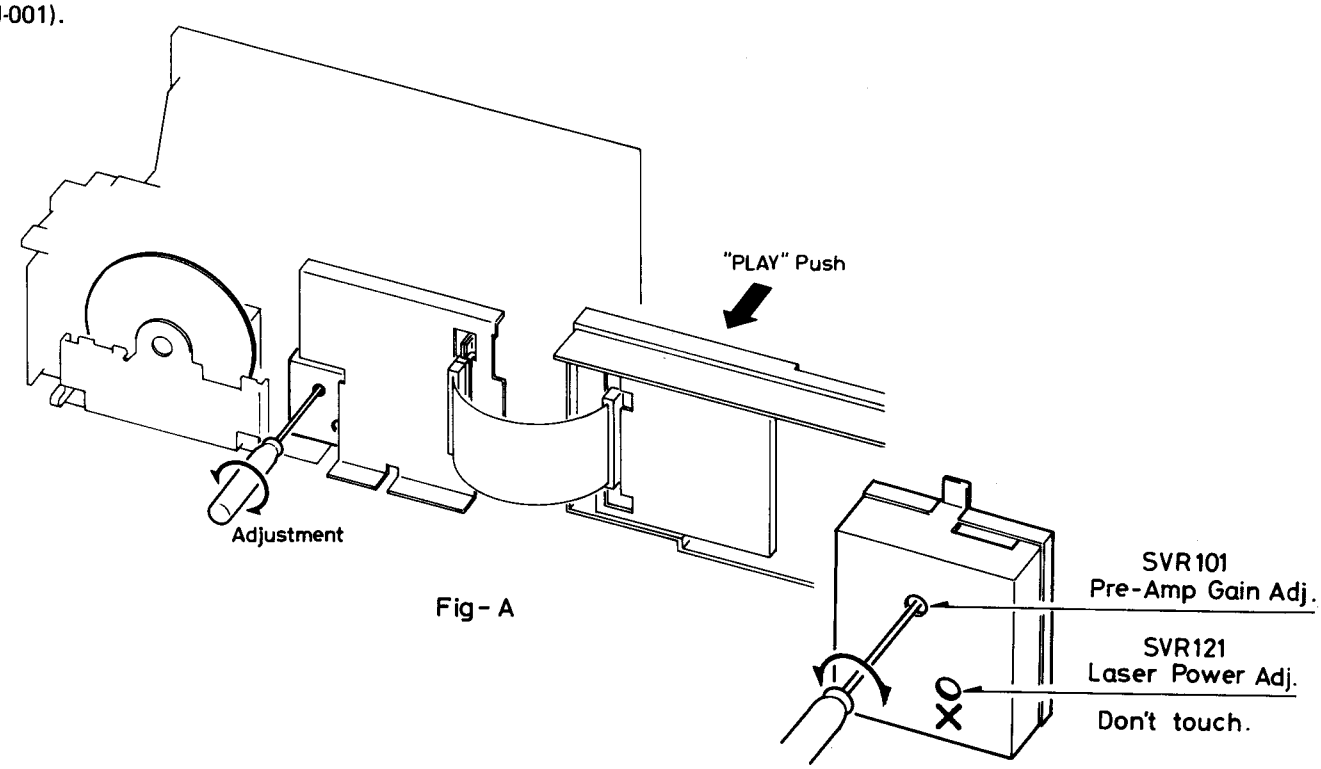



Fig - A

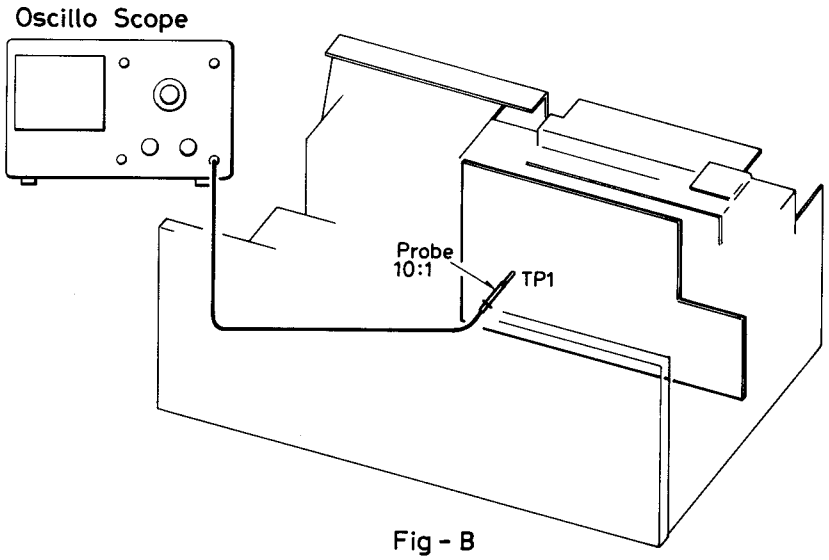



Fig - B

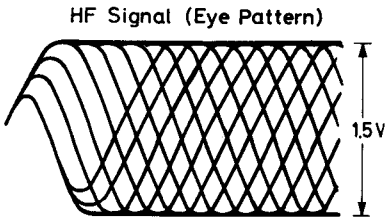



Fig - C

c. As shown in Fig. B, connect an oscilloscope to TP1 (HF signal) of the servo & equalizer board.

d. Switch the power on and prepare test disc No. 1 for play.

e. As shown in Fig. A, press the PLAY switch, and then adjust SVR101 so that the HF signal waveform (see Fig. C) on the oscilloscope screen becomes 1.5 $V^{P-P}$.

**Notes:**

1. Do not turn SVR121 (for adjustment of laser power), which is on the same board. If it is accidentally turned, the pickup may be damaged as a result. Check very carefully which SVR is being turned before making this adjustment.
2. Check whether or not connector CN4 is connected to TP10 before making the adjustment.

**(5) Adjustment of EFM (comparator level)**

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, connect an oscilloscope to TP1 (HF signal) of the servo & equalizer board.

c. Switch the power on, and prepare test disc No. 2 for play.

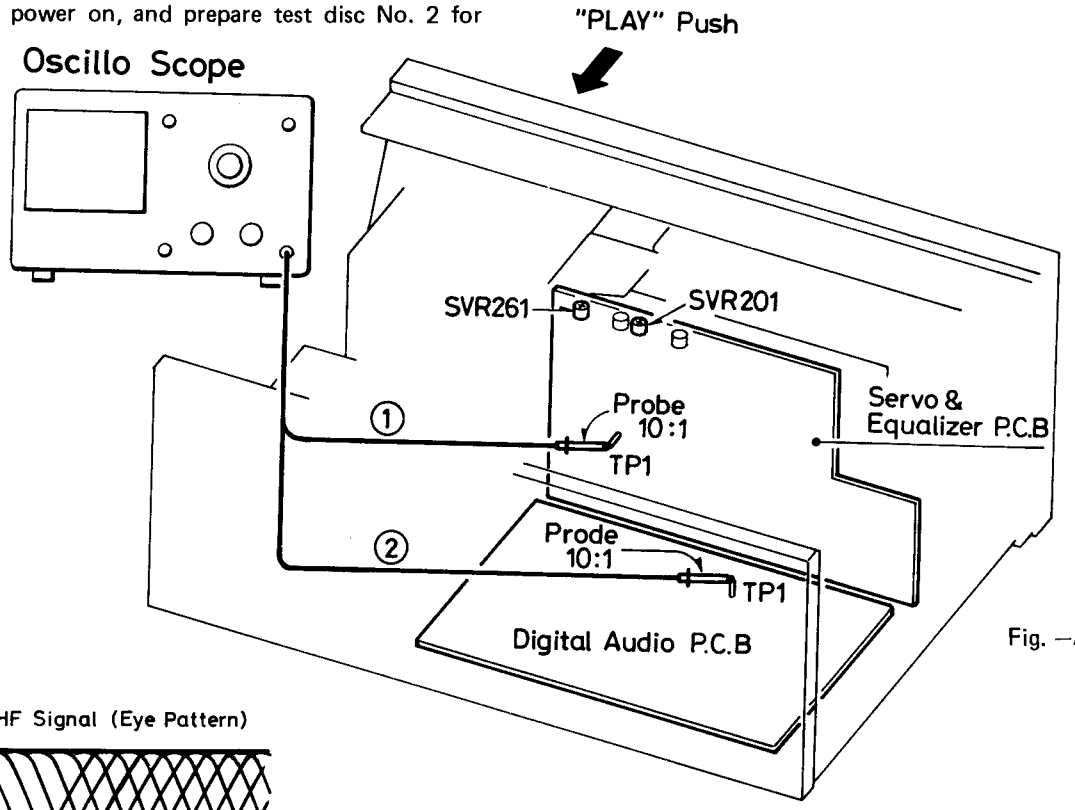



Fig. –A

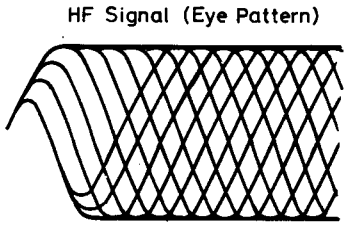



Fig. –B

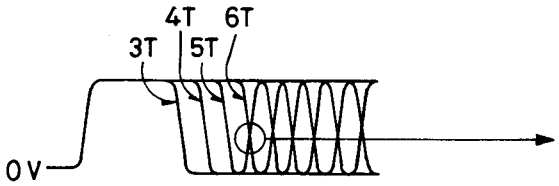
d. As shown in Fig. A, press the PLAY switch, and then adjust SVR201 so that the eye pattern waveform on the oscilloscope screen becomes stabilized. (Refer to the waveform in Fig. B.)

e. As shown in Fig. A, connect an oscilloscope to TP1 (EFM signal) of the digital audio board.

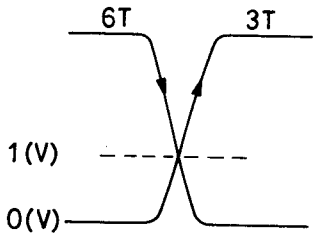
f. As shown in Fig. C, adjust SVR261 to get 1 V at the point of intersection of the first 6T downslope and the first 3T upslope.

Note:

- Take care not to confuse 6T with 7T or 5T. If an error is made, the waveform will deviate in the direction of the horizontal axis.




EFM Signal




3T·6T Cross Point

Fig. –C

**(6) Adjustment of PLL (Phase Locked Loop)**

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, connect an oscilloscope to TP2 of the digital & audio board.

c. Switch the power on, and prepare test disc No. 2 for play.

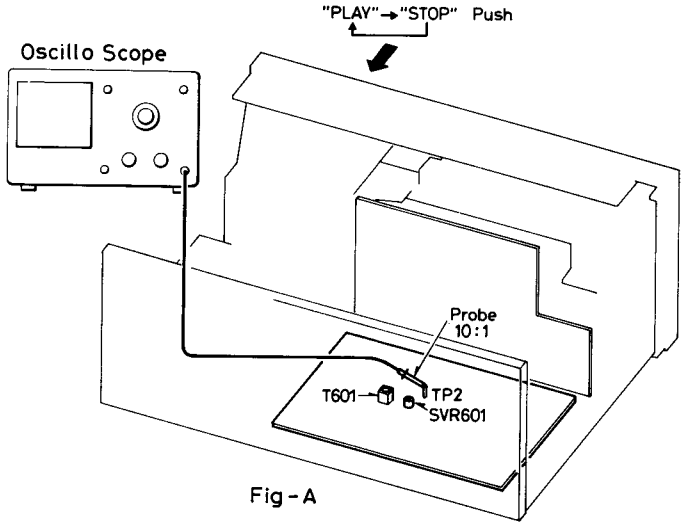



Fig-A

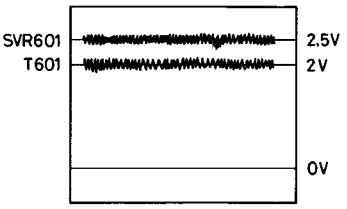



Fig-B

d. As shown in Fig. A, press the PLAY switch, and then adjust T601 (L603) so as to get 2.0 V at the center of the oscilloscope waveform when the music starts. (Refer to the waveform in Fig. B.)

e. Next, press the STOP switch and adjust SVR601. Then press the PLAY → STOP switch. Repeat operation of the PLAY → STOP switch until the voltage is adjusted to 2.5 V. (Refer to the waveform in Fig. B.)
(No change of the voltage will appear if SVR601 is turned during the stop mode. The voltage originally set will appear when the unit is set for play and then once again stopped.)

f. Once again check and adjust as in steps (d) and (e).

**Note:**

- If the adjustment cannot be made, turn SVR601 completely in the clockwise direction (T601 core slightly protruding from the case), and make the adjustment once again.

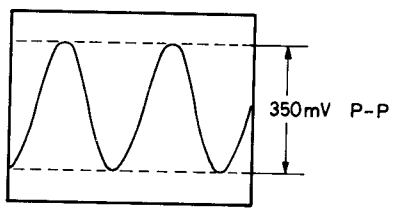



Fig-B

**(7) Adjustment of radial gain**

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, connect a memoryscope to TP4 of the servo & equalizer board.

c. Switch the power on and prepare eccentricity test disc No. 3 (eccentricity width 200 $\mu$m) for play.

d. As shown in Fig. A, press the PLAY switch, and then adjust SVR202 so that the memoryscope signal waveform becomes 350 $mV^{P-P}$. (Refer to the waveform in Fig. B.)

**Note:**

- The eccentricity disc has a slightly enlarged center hole. Set it so that it is slightly out of position during chucking.

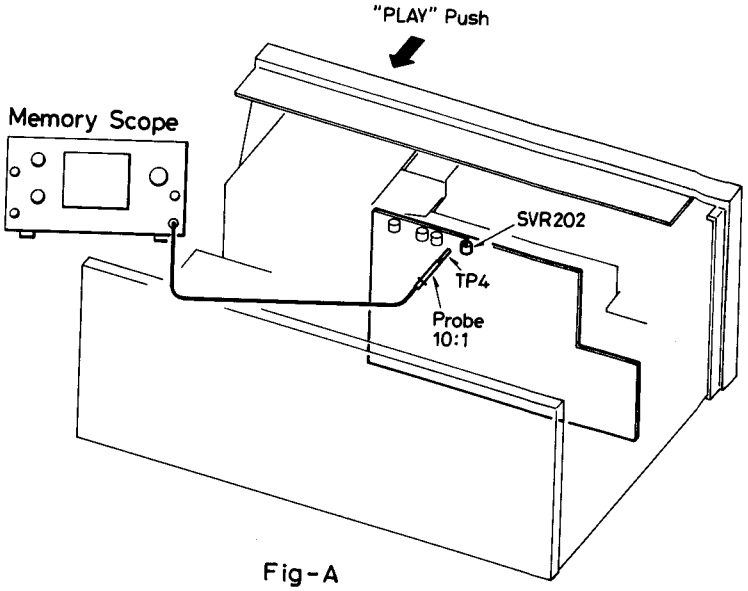



Fig-A

**(8) Adjustment of focus offset**

a. As shown in Fig. A, remove the cabinet.
b. As shown in Fig. A, connect a DC digital voltmeter to TP3 of the servo & equalizer board.
c. Switch the power on, and prepare test disc No. 1 for play.
d. As shown in Fig. A, press the PLAY switch, and then press the STOP switch while the music is playing. Measure the voltage during the stop mode and make a note of the measured voltage.
e. Next, press the PLAY switch, so that the unit is in the play mode, and then adjust SVR201 to obtain a voltage 30 to 40 mV higher than the voltage noted in step (d.)

**Notes:**

1. Do not use a test disc which has surface oscillation.
2. Make the adjustment of 30 to 40 mV in step (e.) so that the eye pattern is not mis-shaped too much.

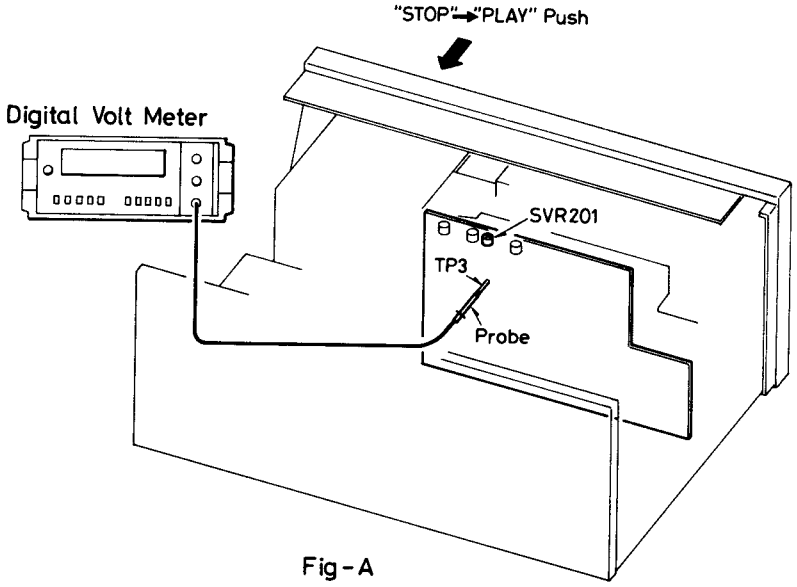



Fig-A

**(9) Adjustment of focus gain**

a. As shown in Fig. A, remove the cabinet.
b. As shown in Fig. A, connect a memoryscope to TP3 (FE signal) of the servo & equalizer board.
c. Switch the power on, and prepare surface oscillation test disc No. 4 (surface oscillation width +400 μm) for play.
d. Play the music in the outermost track of the disc.
e. As shown in Fig. A, adjust SVR203 so that the memory-scope signal waveform becomes 100 mV $^{P-P}$. (Refer to Fig. B.)

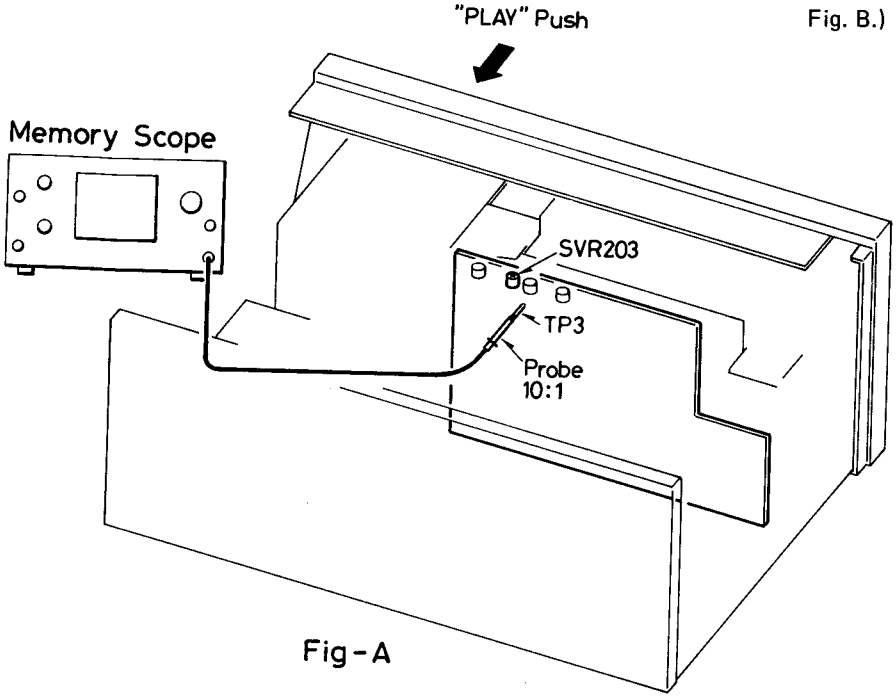



Fig-A

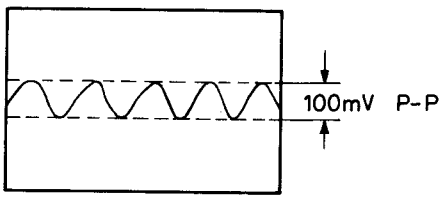



Fig-B

**(10) Checking RE (radial error) voltage and following voltage**

a. As shown in Fig. A, remove the cabinet, bottom lid and disc cover.

b. As shown in Fig. A, Connect an AC digital voltmeter to TP4 of the servo & equalizer board.

c. Switch the power on, and prepare test disc No. 2 for play.

d. As shown in Fig. A, press the PLAY switch, and, with the music playing, connect a connection jig (AJ-005) to TP9 of the servo & equalizer board. Attach the clip from the connection jig (AJ-005) to the metal part of the mechanism (chassis ground). Then check to be sure that the voltage shown on the AC volt meter is 300 mV or more. ($\overline{FS}$/OPEN (IC201 – 4-pin) low).

e. Next, as shown in Fig. A, disconnect the connection jig (AJ-005) connected in step(d.), and then connect a DC digital voltmeter to TP8 of the servo & equalizer board.

f. While the music is playing, free the gear part of the stepping motor, and check to be sure that the DC volt meter voltage reading is 7 V or more.

**Notes:**

1. The expression "while the music is playing" in steps(d.) and (f.) does not refer to parts between turns; it is while music is only actually playing.
2. If the reading is less than specified, repeat the adjustments in steps (3) through (9). If, however, the HF signal waveform is not clean, begin from step (2).

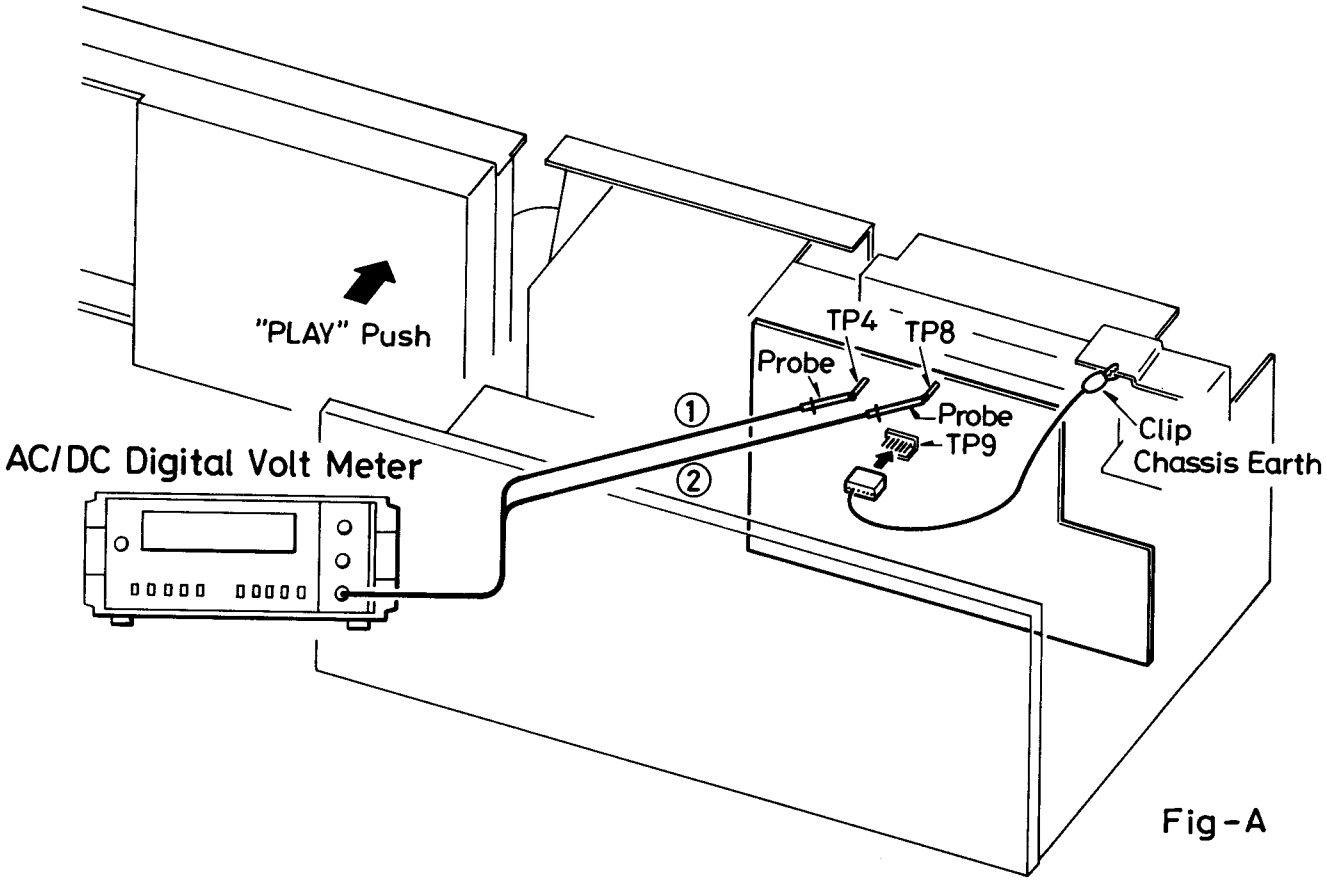
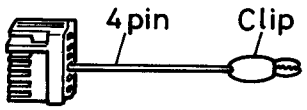



Fig-A




6 pin Socket

(AJ-005)

**(11) Adjustment of pause**

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, set the oscilloscope to pattern 3, and connect it to TP9 (IC201 — 5-pin ($\overline{\text{N.HOP}}$), 3-pin ($\overline{\text{P.HOP}}$), 1-pin (Z-DET)) of the servo & equalizer board.

c. Switch the power on, and prepare test disc No. 2 for play.

d. Press the PAUSE switch, use the FWD ACCESS switch to indicate the second tune, and then, when the real-time counter in dicates a bar (——) indication (between tunes), make the adjustment.

e. As shown in Fig. A, adjust SVR501 of the digital & audio board so that the width of the signal waveform ($\overline{\text{N.HOP}}$) on the oscilloscope screen becomes 200 μsec. (Refer to Fig. B.)

f. At this time, check to be sure that there is no track-jump waveform (large peak shape) during the time T of the signal waveform (Z-DET) on the oscilloscope. (Refer to Fig. B.)

**Notes:**

1. The pause mode mentioned in step (d.) will automatically change to the stop mode after 5 minutes have passed.
2. If the track-jump waveform mentioned in step (f.) does appear, repeat adjustments (3) through (9). If, however, the HF signal waveform is not clean, begin from step (2).
3. For a pattern 2 oscilloscope, input $\overline{\text{P.HOP}}$ to channel A and apply the trigger, and observe $\overline{\text{N.HOP}}$ or Z.DET on channel B.
4. Switch the input mode of the oscilloscope to the CHOP. SWEEP mode, and adjust the NORM.LEVEL control, so that the waveform is in the (—) SLOPE position. (The trigger LED should illuminate.)

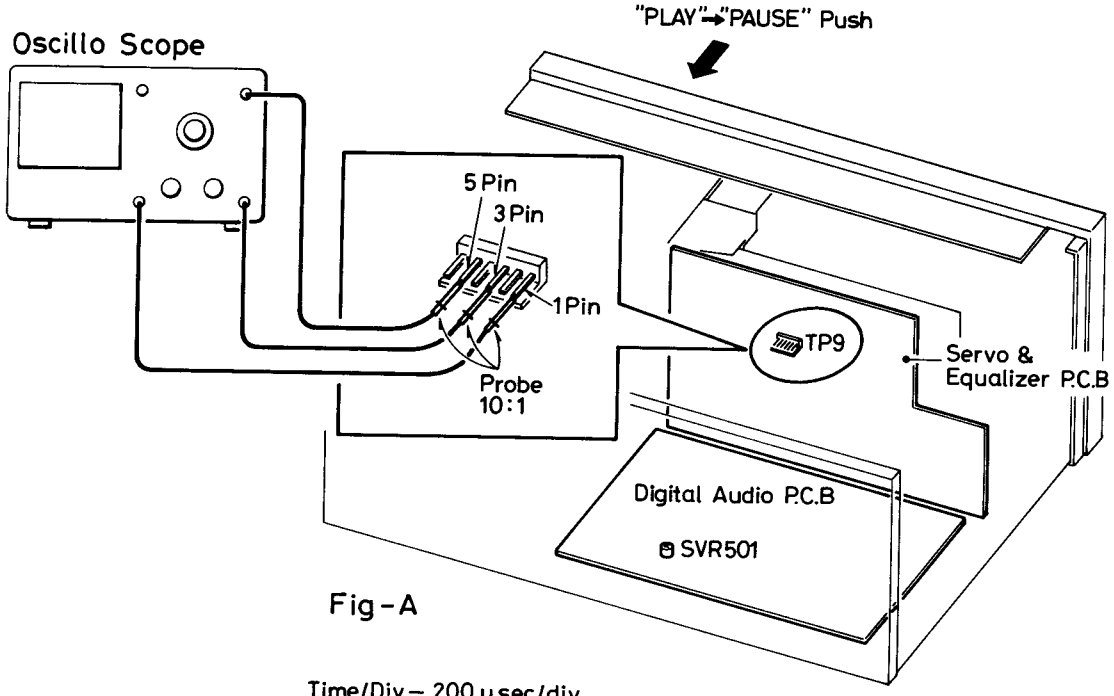



Fig-A

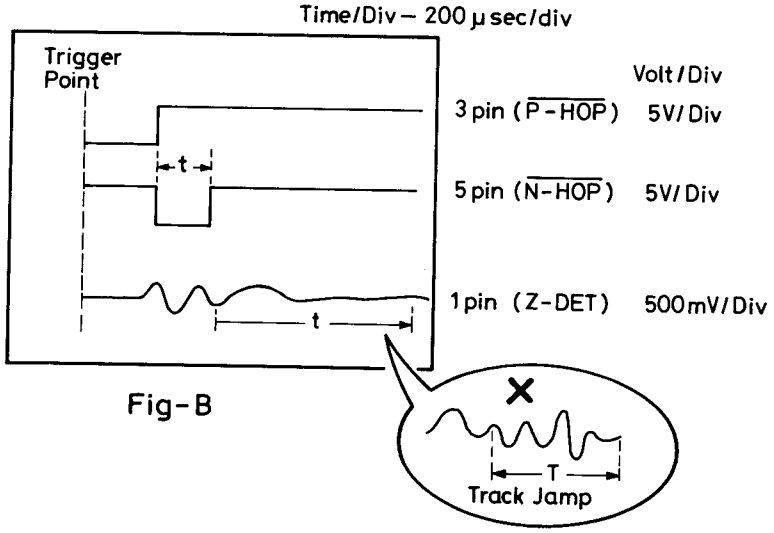



Fig-B

**(12) Adjustment of audio offset**

a. As shown in Fig. A, remove the cabinet.

b. As shown in Fig. A, connect a DC digital voltmeter to TP11 (L ch.) or TP12 (R ch.) of the digital & audio board.

c. Switch the power on, and then adjust SVR701 (L ch.) or SVR702 (R ch.) to get a 0.000 V reading on the DC digital voltmeter.

**Notes:**

1. The adjustment can be considered correct if, after adjustment, a voltage check shows ±0.02 V or less.
2. Adjust both channels (L and R).

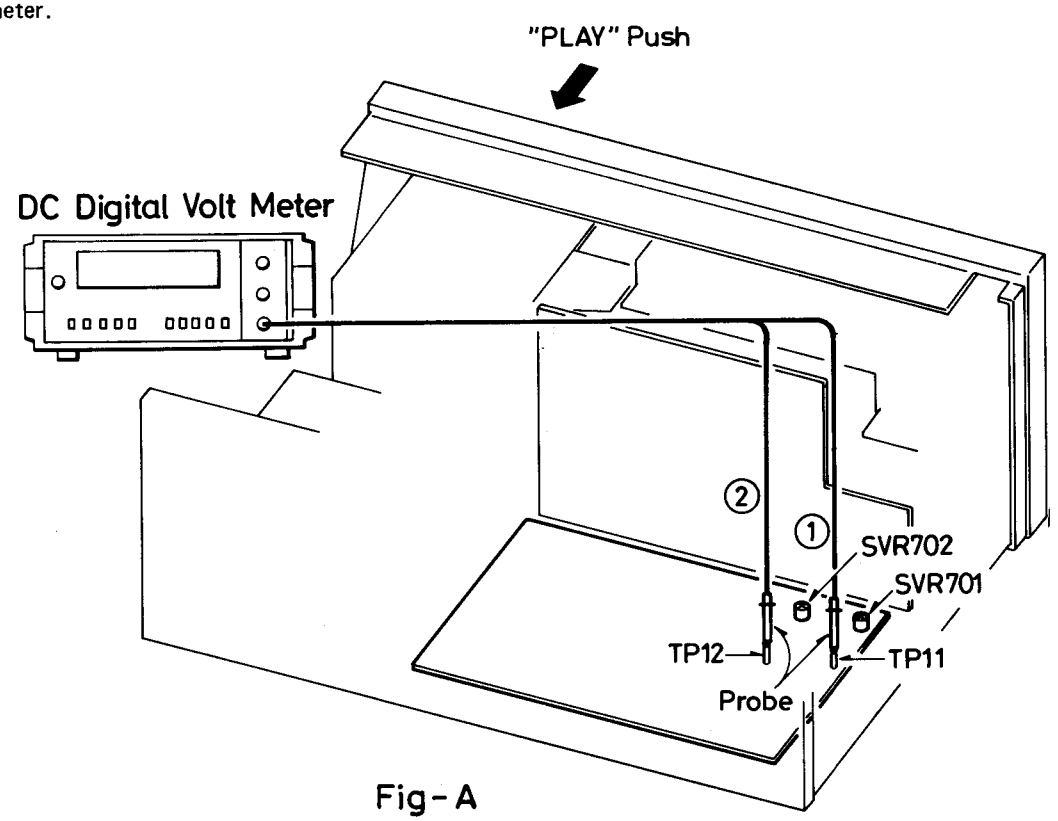



Fig-A

**(13) Checking adjustments and minor adjustments**

a. EFM adjustment

- First 6T downslope and second 3T upslope should intersect at 1 V.
- Observe the signal waveform of TP6 (IC604 – 11-pin (C1F1)), and adjust so that the error rate (error-stop signal) is minimized.

b. Focus offset adjustment

- Measured voltage during the stop mode and play mode should be as follows:

  Play mode voltage = stop mode voltage +30 ~ 40mV

c. PLL adjustment

- Measured voltage during the stop mode and play mode should be as follows:

  Play mode voltage = 2.0 V

  Stop mode voltage = 2.5 V

d. Test disc check

- Black spot disc ... test disc No. 5 (with 300 μm black scratch)

  There should be no track jump during play.
- Surface oscillation disc ... test disc No. 4 (surface oscillation width +400μm)

  There should be no track jump during play of the lead-in of the 1st, 4th and 12th tunes.
- Eccentricity disc ... test disc No. 3 (eccentricity width 200 μm)

  There should be no track jumping (especially during lead-in).

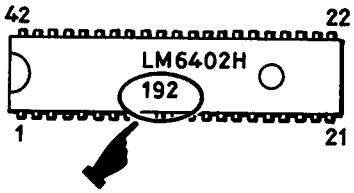
e. Pause adjustment

- Prepare test discs No. 1 and No. 2 for play, and then change from the play mode to the pause mode. When the unit is then switched to the play mode, there will be a deviation shown by the display of the real-time counter at the moment play starts, but this deviation should not exceed 2 seconds. This should be checked at the 1st, 6th and 12th tunes.

f. Test disc No. 6

- There should be no noise when the 8th tune (10 kHz) of test disc No. 6 is played.
- The EFM adjustment and the minor adjustment to minimize the error rate of C2F2 should be made once again.

## 11. REPLACEMENT OF IC401 LM6402H




Program Display No.

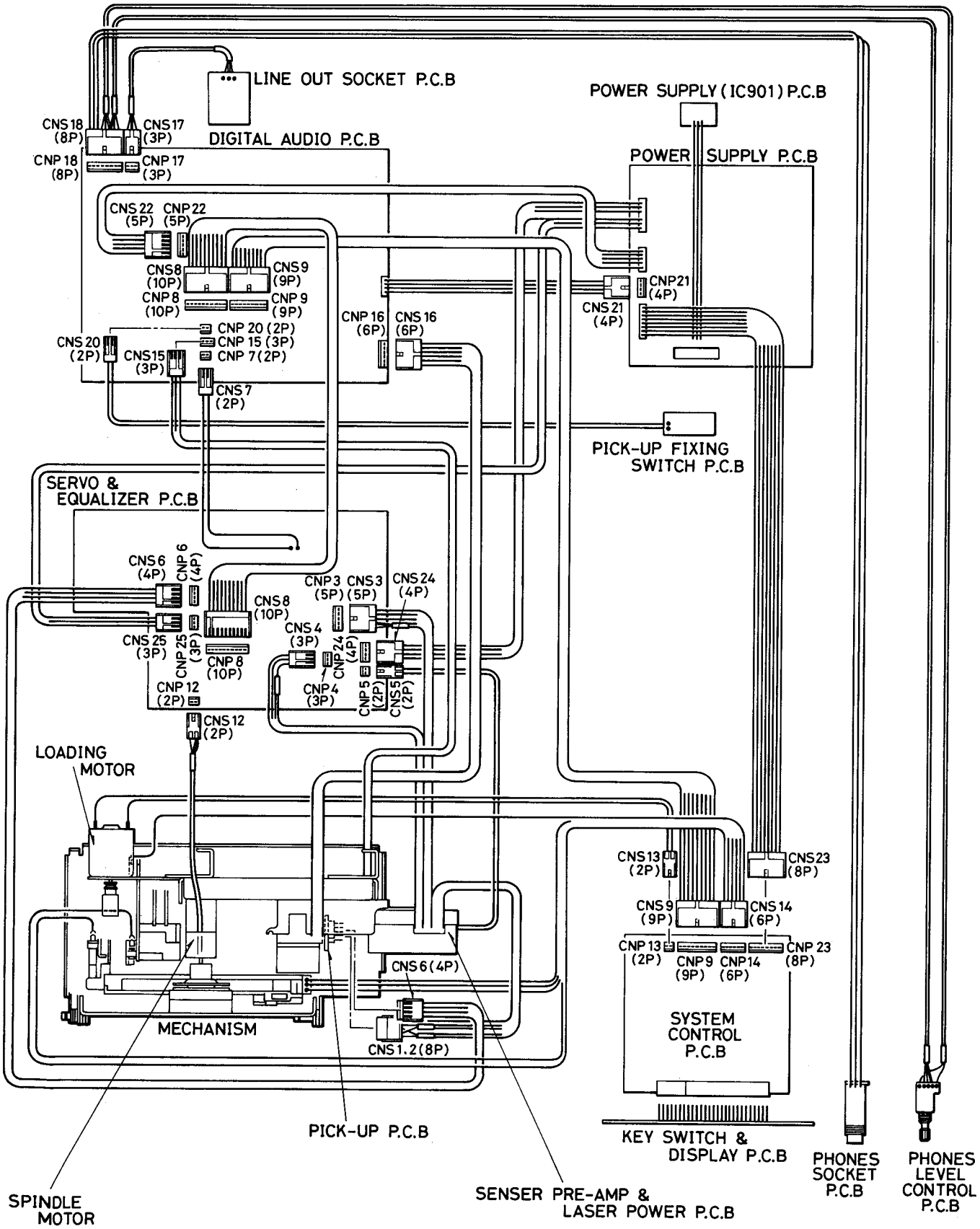
There are 2 types of the IC401:
LM6402H–175 and LM6402H–192.

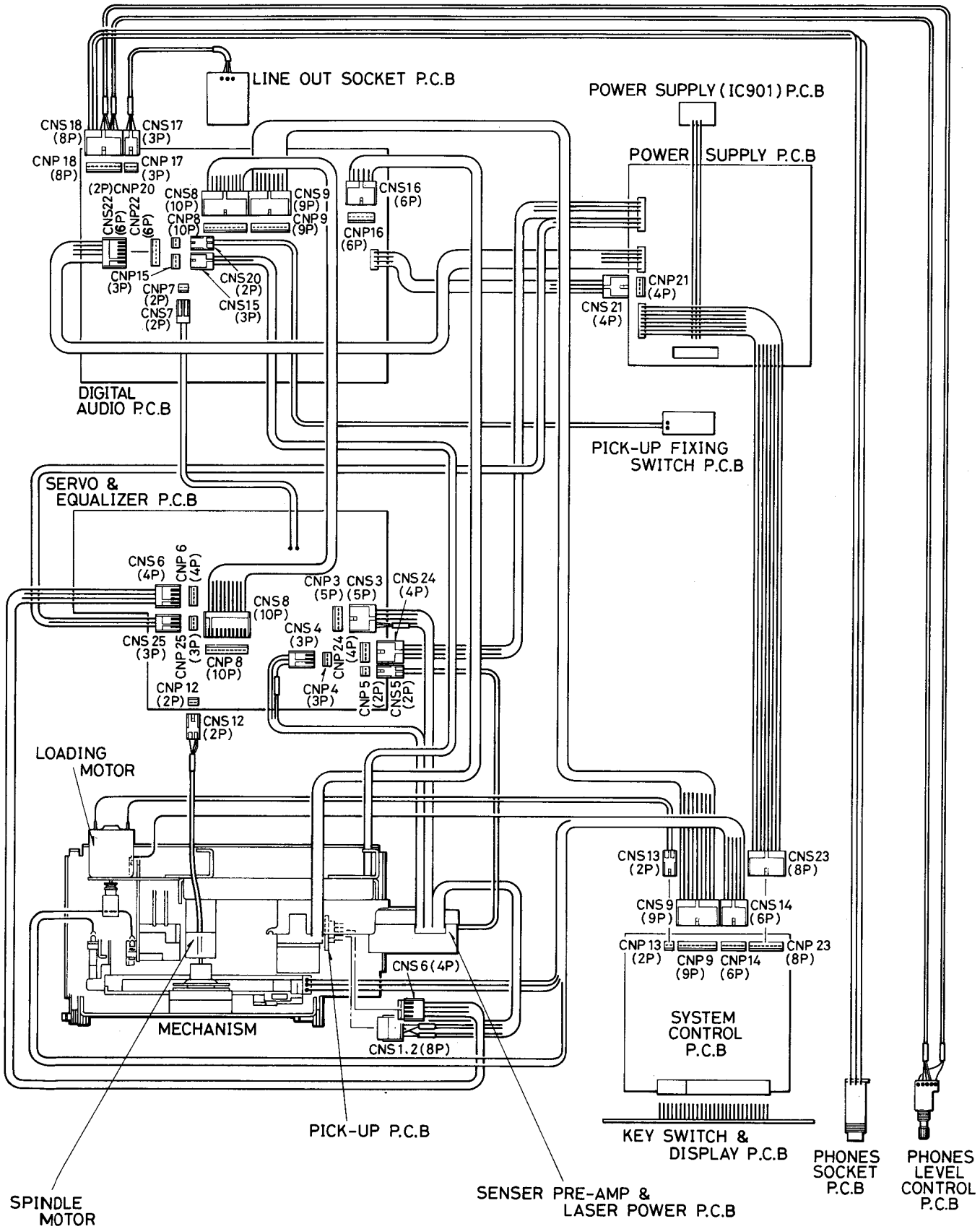
If LM6402H–175 is to be replaced with LM6402H–192 (improved type), the parts attached to the servo & equalizer board (4-250T-90100) and the sensor preamplifier/laser power board (4-250T-90000) should also be replaced according to the table below, and then adjustments should be made again. Note that, if the LM6402H-192 must be replaced, it must not be replaced with the LM6402H–175; be sure to replace the LM6402H–192 with the same type.

### REPLACEMENT OF IC401 LM6402H

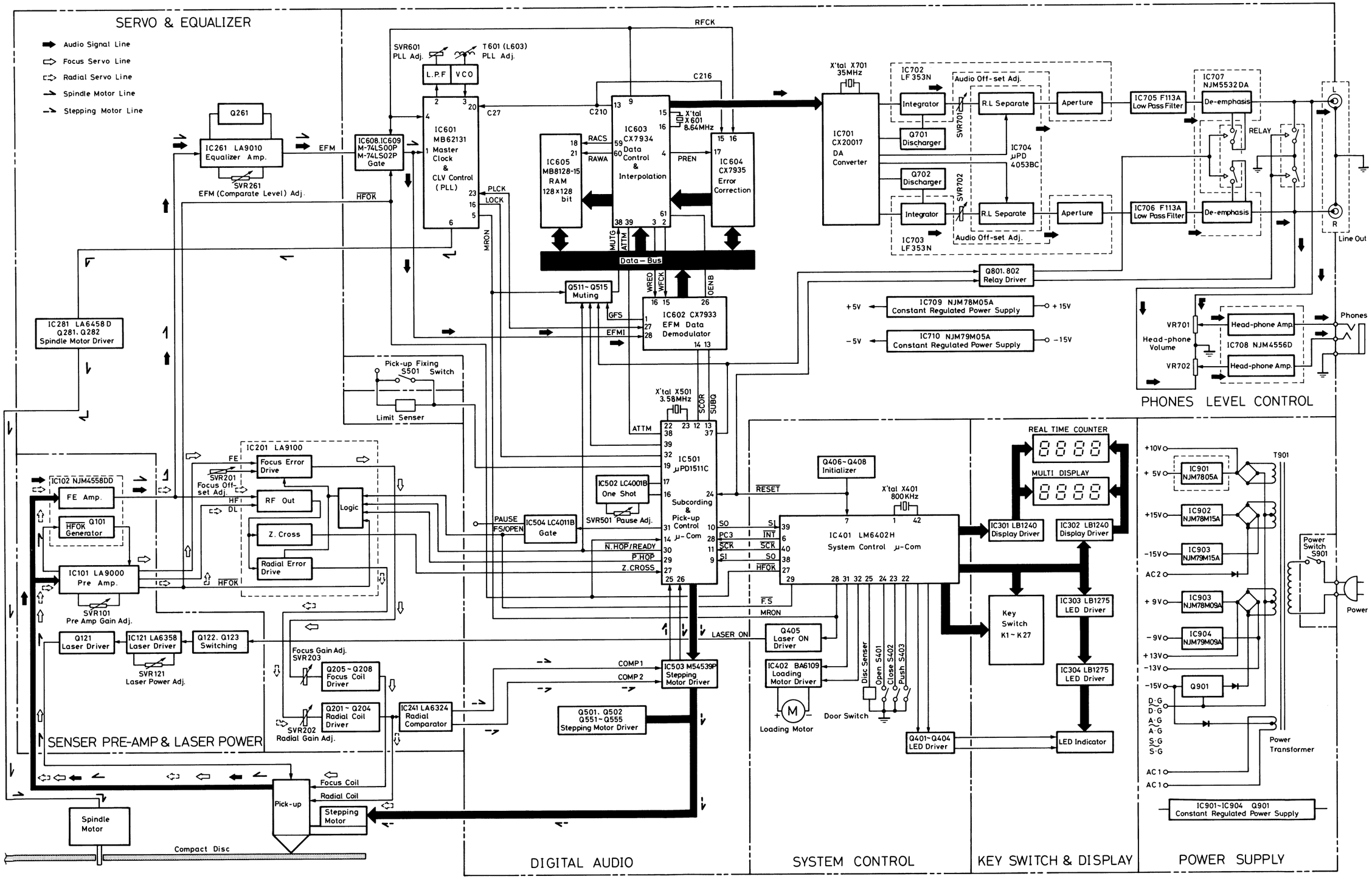
| IC401 / Changed parts | | LM6402H–175 | LM6402H–192 |
|---|---|---|---|
| SERVO & EQUALIZER P. C. B. (4-250T-90100) | | | |
| Resistors | R200 | Carbon, 8.2K ohm, ±5%, 1/6W | – – – – – – – – – – – – – – – – |
| | R204 | Carbon, 4.7K ohm, ±5%, 1/6W | Carbon, 2.2K ohm, ±5%, 1/6W |
| | R206 | Carbon, 15K ohm, ±5%, 1/6W | Carbon, 2.7K ohm, ±5%, 1/6W |
| | R208 | Carbon, 22K ohm, ±5%, 1/6W | Carbon, 39K ohm, ±5%, 1/6W |
| | R209 | Carbon, 2.2K ohm, ±5%, 1/6W | Carbon, 1K ohm, ±5%, 1/6W |
| | R210 | Carbon, 100K ohm, ±5% 1/6W | Carbon, 82K ohm, ±5%, 1/6W |
| | R211 | Carbon, 56K ohm ±5%, 1/6W | Carbon, 33K ohm, ±5%, 1/6W |
| | R212 | Carbon, 22K ohm, ±5%, 1/6W | Carbon, 100K ohm, ±5%, 1/6W |
| Capacitors | C207 | Mylar, 0.0033μF, ±5%, 50V | Mylar, 0.0058μF, ±5%, 50V |
| | C208 | Mylar, 0.22μF, ±10%, 50V | Non-polar, 0.47μF, 50V, NP |
| | C210 | Mylar, 0.0068μF, ±5%, 50V | Mylar, 0.022μF, ±5%, 50V |
| | C211 | Mylar, 0.1μF, ±5%, 50V | Mylar, 0.0047μF, ±5%, 50V |
| | C227 | – – – – – – – – – – – – – – – – | Connect non-polar 4.7μF, 25V, NP, to both ends of C216. |
| Others | | | |
| | TP 11 (2P, Plug) | Short circuit both terminals after adjustment. | – – – – – – – – – – – – – – – – |
| | TP 12 (2P, Plug) | Open both terminals. | Short circuit both terminals. |
| SENSOR PREAMP. & LASER POWER P. C. B (4-250T-90000) | | | |
| Resistors | R106 | Carbon, 330K ohm, ±5%, 1/6W | Carbon, 100K ohm, ±5%, 1/6W |
| | R107 | Carbon, 330K ohm, ±5%, 1/6W | Carbon, 100K ohm, ±5%, 1/6W |

## 12. PRINTED CIRCUIT BOARD CONNECTIONS

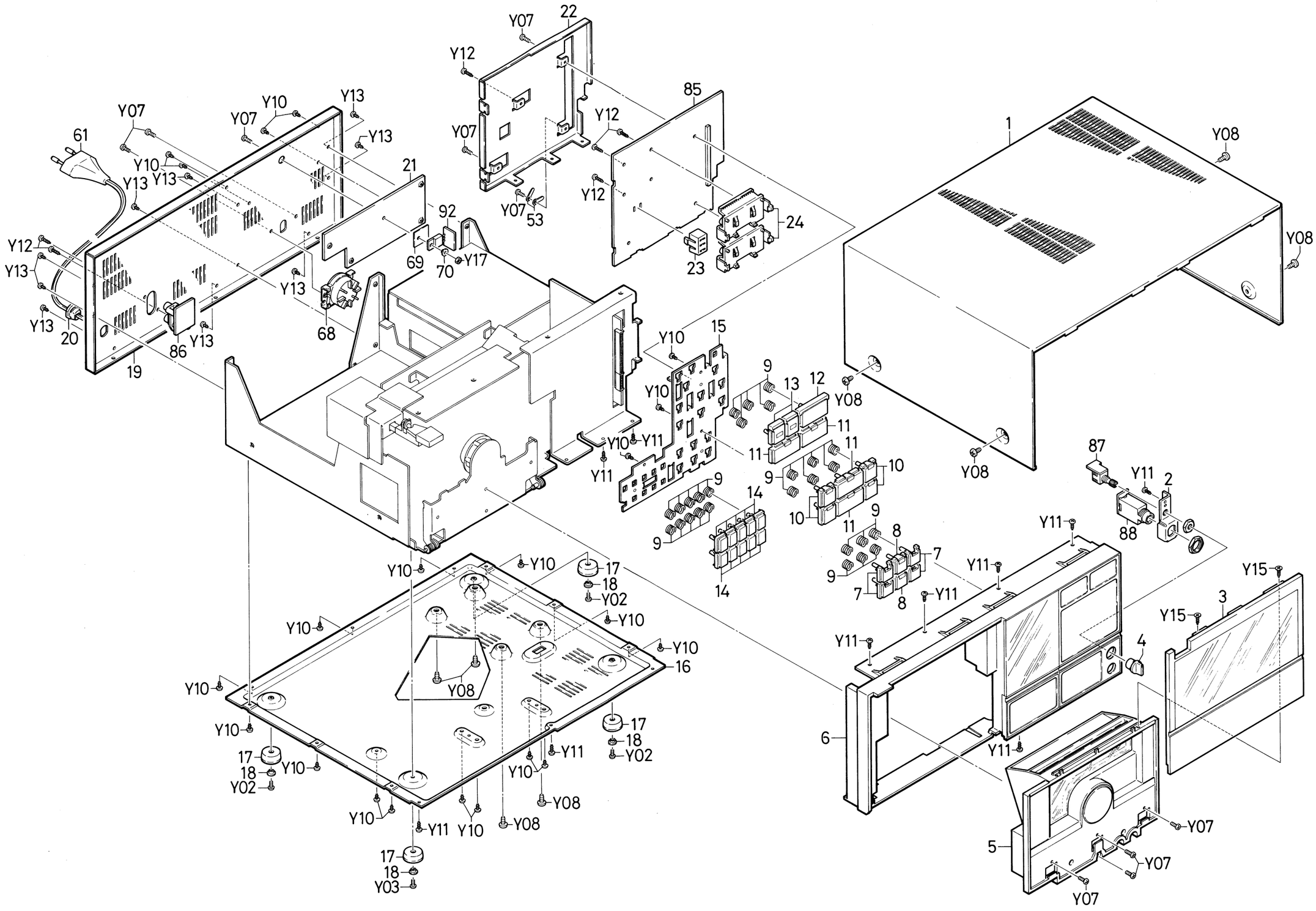



LINE OUT SOCKET P.C.B
POWER SUPPLY (IC901) P.C.B
POWER SUPPLY P.C.B
CNS18 (8P)
CNS17 (3P)
CNP18 (8P)
CNP17 (3P)
(2P)CNP20
CNS22 (6P)
CNP22 (6P)
CNS8 (10P)
CNS9 (9P)
CNP8 (10P)
CNP9 (9P)
CNS16 (6P)
CNP16 (6P)
CNP15 (3P)
CNP7 (2P)
CNS7 (2P)
CNS20 (2P)
CNS15 (3P)
CNP21 (4P)
CNS21 (4P)
DIGITAL AUDIO P.C.B
PICK-UP FIXING SWITCH P.C.B
SERVO & EQUALIZER P.C.B
CNS6 (4P)
CNP6 (4P)
CNP3 (5P)
CNS3 (5P)
CNS24 (4P)
CNS8 (10P)
CNS4 (3P)
CNS25 (3P)
CNP25 (3P)
CNP8 (10P)
CNP24 (4P)
CNP12 (2P)
CNP4 (3P)
CNP5 (2P)
CNS5 (2P)
CNS12 (2P)
LOADING MOTOR
CNS13 (2P)
CNS23 (8P)
CNS9 (9P)
CNS14 (6P)
CNP13 (2P)
CNP9 (9P)
CNP14 (6P)
CNP23 (8P)
CNS6 (4P)
SYSTEM CONTROL P.C.B
MECHANISM
CNS1.2 (8P)
PICK-UP P.C.B
KEY SWITCH & DISPLAY P.C.B
PHONES SOCKET P.C.B
PHONES LEVEL CONTROL P.C.B
SPINDLE MOTOR
SENSER PRE-AMP & LASER POWER P.C.B

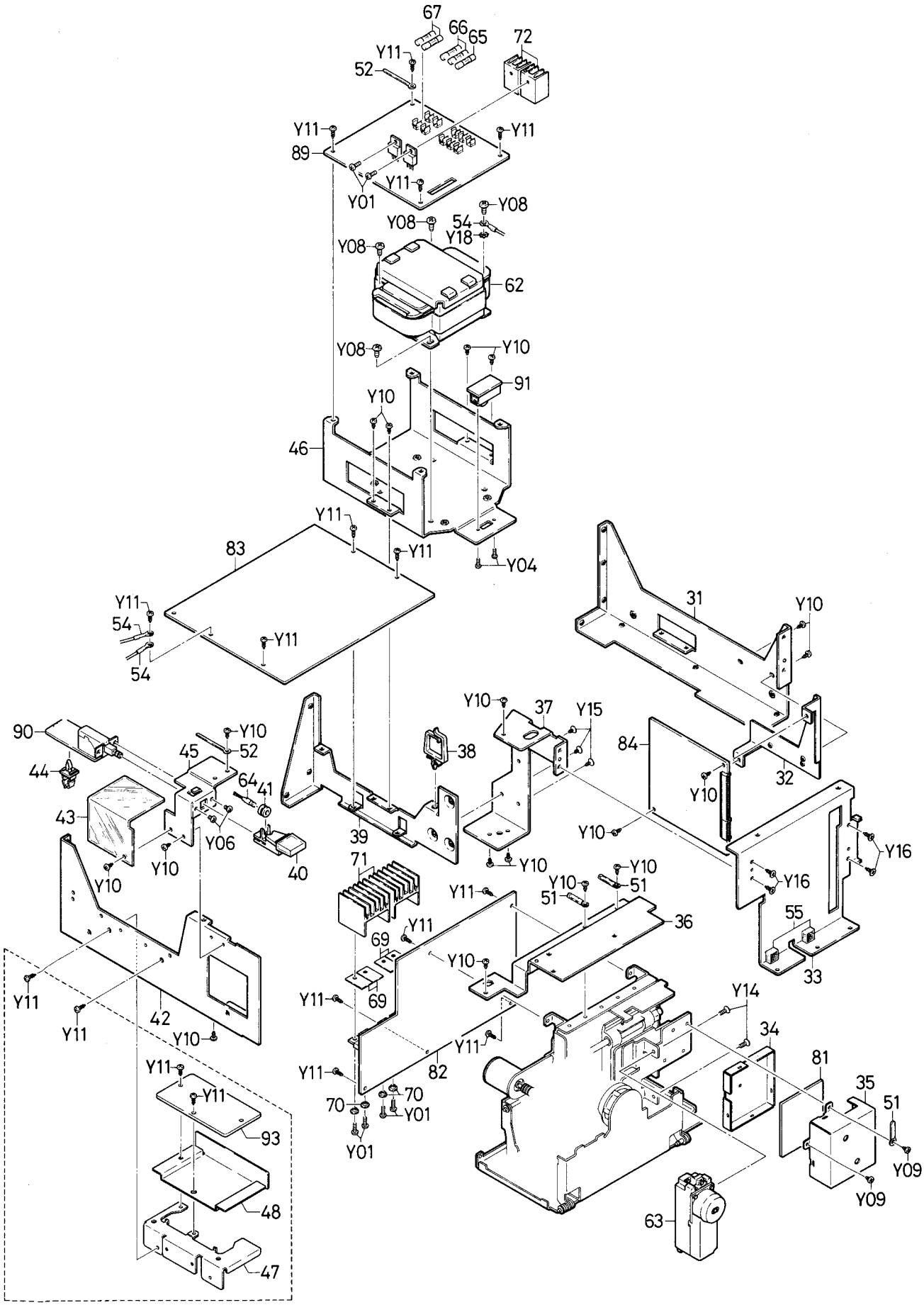
## 13. BLOCK DIAGRAM (FOR ADJUSTMENT)



## 14. CABINET EXPLODED VIEW



## 15. CHASSIS EXPLODED VIEW



## 16. PARTS LIST

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **PACKING** | | | |
| | 141-6-133T-44304 | Individual Carton | 1 |
| | 141-6-144T-89000 | Pad, Left | 1 |
| | 141-6-144T-89100 | Pad, Right | 1 |
| | 141-6-410T-91103 | Instruction Manual | 1 |
| | 141-6-235T-50600 | Inner Polyethylene Lamina Bag, Set | 1 |
| | 141-6-472T-20701 | Caution Label, Pick-up Fixing Screw, Cabinet mtg. | 1 |
| | 141-6-333T-00100 | Cleaning Cloth, Compact Disc | 1 |
| | 4-243T-13371 | Lead Cord, LINE OUT | 1 |
| **CABINET & CHASSIS** | | | |
| 1 | 141-2-111T-55500 | Cabinet | 1 |
| 2 | 141-2-310T-87300 | Bracket, PHONES | 1 |
| 3 | 141-0-124T-37501 | Top Lid Assembly, Disc Cover | 1 |
| 4 | 141-2-163T-89603 | Rotary Knob, PHONES LEVEL | 1 |
| 5 | 141-0-224T-14100 | Bracket Lid Assembly, Disc Holder | 1 |
| 6 | 141-0-122T-47200 | Front Panel Assembly | 1 |
| 7 | 141-2-160T-19900 | Push Button, MEMORY/ MEMORY CLEAR/RECAL/ PROGRAM CLEAR | 4 |
| 8 | 141-0-160T-19900 | Push Button Assembly, PROGRAM WRITE/ PROGRAM PLAY | 2 |
| 9 | 141-2-856T-11300 | Spring Coil | 27 |
| 10 | 141-0-160T-20100 | Push Button Assembly, F FWD/ F REW/PAUSE/REPEAT | 4 |
| 11 | 141-0-160T-20000 | Push Button Assembly, FWD ACCESS/PLAY/ BACK ACCESS/STOP | 4 |
| 12 | 141-2-160T-20200 | Push Button, OPEN/CLOSE | 1 |
| 13 | 141-0-160T-20300 | Push Button Assembly, REAL TIME COUNTER | 2 |
| 14 | 141-2-160T-19800 | Push Button, PROGRAM 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 | 10 |
| 15 | 141-0-214T-07100 | Bracket Frame Assembly, Key Switch | 1 |
| 16 | 141-0-125T-30401 | Bottom Lid Assembly | 1 |
| 17 | 141-2-174T-13600 | Stand, Bottom Lid Mtg. | 4 |
| 18 | 141-2-462T-77800 | Boss, Stand Mtg. | 4 |
| 19 | 141-2-126T-42001 | Back Lid | 1 |
| 20 | 141-2-464T-14400 | Fixer, Power Cord Mtg. | 1 |
| 21 | 141-2-368T-27200 | Heat Sink, IC mtg. | 1 |
| 22 | 141-2-315T-26600 | Reinforcement, KEY SWITCH & DISPLAY P. C. B | 1 |
| 31 | 141-2-315T-26800 | Reinforcement, Righ Side | 1 |
| 32 | 141-2-310T-86500 | Bracket, SYSTEM CONTROL P. C. B. | 1 |
| 33 | 141-2-315T-27900 | Rinforcement | 1 |
| 34 | 141-2-323T-01200 | Shield Box, LASER POWER P. C. B. Back | 1 |
| 35 | 141-2-323T-01300 | Shield Box, LASER POWER P. C. B. Front | 1 |
| 36 | 141-2-315T-26500 | Reinforcement, Mechanism Top | 1 |
| 37 | 141-2-310T-82000 | Bracket, Mechanism Right | 1 |
| 38 | 141-2-464T-20700 | Fixer | 1 |
| 39 | 141-2-315T-27700 | Reinforcement | 1 |
| 40 | 141-0-132T-19900 | Sign Window Assembly, Power Switch | 1 |
| 41 | 141-2-445T-08701 | Rubber Cushion, Pilot Lamp | 1 |
| 42 | 141-2-315T-26700 | Reinforcement, Left Side | 1 |
| 43 | 141-2-135T-88600 | Cover, Power Switch | 1 |
| 44 | 141-2-464T-43000 | Fixer | 1 |
| 45 | 141-2-310T-82100 | Bracket, Power Switch | 1 |
| 46 | 141-2-310T-82200 | Bracket, Power Transformer | 1 |
| 47 | 141-2-310T-91800 | Bracket, Line Filter P. C. B | 1 |
| 48 | 141-2-135T-90300 | Cover, Line Filter P. C. B. | 1 |
| 51 | 123-2-472R-00601 | Lug | 3 |
| 52 | 141-2-472T-00101 | Lug | 2 |
| 53 | 123-2-472R-00401 | Lug, Capacitor mtg. | 2 |
| 54 | 4-237T-11200 | Terminal | 3 |
| 55 | 141-2-447T-32502 | Rubber Cushion, 10 x 10 x 6mm | 2 |
| | 141-2-453T-06003 | Fiber Washer, 3.5 x 10 x 2mm | 2 |
| | 141-2-247T-19000 | Sheet, Front Panel mtg. | 3 |
| | 141-2-247T-20000 | Sheet, 40 x 8.5 x 0.05mm | 1 |
| | 141-2-246T-88402 | Sheet, 20 x 20 x 1mm | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **CABINET & CHASSIS** | | | |
| | 141-2-421T-44800 | Special Screw, Pick-up Fixing Screw (Shipping Screw) | 1 |
| | 141-2-184T-02300 | UL Tape, Shield Box (Ref. No. 34) mtg., 12 x 25mm | 3 |
| **HARDWARE** | | | |
| Y01 | | Pan Hd. Screw, 3 x 8mm | 6 |
| Y02 | | Pan Hd. Forming Screw, 3 x 6mm | 3 |
| Y03 | | Pan Hd. Forming Screw, 3 x 10mm | 1 |
| Y04 | | Binding Hd. Screw, 2.6 x 6mm | 2 |
| Y05 | | | |
| Y06 | | Binding Hd. Screw, 3 x 6mm | 2 |
| Y07 | | Binding Hd. Screw, 3 x 8mm | 10 |
| Y08 | | Binding Hd. Screw, 4 x 8mm | 12 |
| Y09 | | Binding Hd. Tapping Screw, 3 x 4mm | 2 |
| Y10 | | Binding Hd. Tapping Screw, 3 x 6mm | 39 |
| Y11 | | Binding Hd. Tapping Screw, 3 x 8mm | 27 |
| Y12 | | Binding Hd. Tapping Screw, 3 x 10mm | 6 |
| Y13 | | Binding Hd. Forming Screw, 3 x 4mm | 9 |
| Y14 | | Flat Hd. Screw, 3 x 6mm | 2 |
| Y15 | | Flat Hd. Tapping Screw, 3 x 4mm | 5 |
| Y16 | | Pan Hd. Forming Screw, 3 x 4mm | 4 |
| Y17 | | Nut, 3mm | 1 |
| Y18 | | External Tooth Lock Washer, 4mm | 1 |
| **ELECTRICAL PARTS** | | | |
| 61 | 4-243T-84973 | ⚠Power Cord | 1 |
| 62(T901) | 4-300T-67400 | ⚠Power Transformer | 1 |
| 63 | 4-180T-00200 | ⚠Pick-up | 1 |
| 64(PL) | 4-612T-14972 | Lamp, 8V 100mA, Power Switch | 1 |
| 65(FU901) | 4-234T-10590 | ⚠Fuse, 3.15A | 1 |
| 66(FU902,903) | 4-234T-10583 | ⚠Fuse, 800mA | 2 |
| 67(FU904,905) | 4-234T-10587 | ⚠Fuse, 1.6A | 2 |
| 68(S902) | 4-238T-19171 | ⚠Switch, Voltage Selector | 1 |
| 69 | 141-2-327T-26100 | Insulator, IC901 mtg., Back Lid | 1 |
| 70 | 141-2-243T-09800 | Base, IC901 mtg., Back Lid | 1 |
| CNS 6 | 4-240T-45900 | Socket, 4p | 1 |
| CNS 8 | 4-240T-46100 | Socket, 10p | 1 |
| CNS 9 | 4-240T-46200 | Socket, 9p | 1 |
| C773,774 | | Ceramic, 0.01μF, +80—20% 50V | 2 |
| **SENSER PRE—AMP. & LASER POWER P. C. B. ASS'Y** | | | |
| 81 | 141-4-250T-90000 | P.C.B. Ass'y, Senser Pre-Amp. & Laser Power | 1 |
| IC101 | | Integrated Circuit, LA9000 | 1 |
| IC102 | | Integrated Circuit, NJM4558DD | 1 |
| IC121 | | Integrated Circuit, LA6358 | 1 |
| Q101 | | Transistor, 2SC536H | 1 |
| Q121 | | Transistor, 2SD612E | 1 |
| Q122 | | Transistor, 2SB598F | 1 |
| Q123 | | Transistor, 2SA608F | 1 |
| D101,102 | | Diode, GMA01 | 2 |
| D121 | | Diode, GMA01 | 1 |
| D122 | | Diode, GZA5.6Z | 1 |
| D123 | | Diode, GMA01 | 1 |
| D124 | | Diode, GZA18Y | 1 |
| L121 | 4-253T-14824 | Filter, 22μH | 1 |
| | 141-2-322T-78600 | Shield Plate | 1 |
| CNS 1 | 4-240T-45500 | Socket, 5p | 1 |
| CNS 4 | 4-240T-45700 | Socket, 3p | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **SENSER PRE--AMP. & LASER POWER P. C. B. ASS'Y** | | | |
| CNS 3 | 4-240T-45600 | Socket, 5p | 1 |
| CNS 5 | 4-240T-45800 | Socket, 2p | 1 |
| SVR101 | 4-220T-04980 | Semi-Fixed Resistor, 4.7K ohm | 1 |
| SVR121 | 4-220T-04982 | Semi-Fixed Resistor, 10K ohm | 1 |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type 1/6W, , ±5% unless otherwise noted. | | |
| R101 | | 1.2K ohm | 1 |
| R102 | | 3.3K ohm | 1 |
| R103 | | 3.3K ohm | 1 |
| R104 | | 3.3K ohm | 1 |
| R105 | | 3.3K ohm | 1 |
| R106 | | 100K ohm | 1 |
| R107 | | 100K ohm | 1 |
| R108 | | 4.7K ohm | 1 |
| R109 | | 22K ohm | 1 |
| R110 | | 8.2K ohm | 1 |
| R111 | | 1K ohm | 1 |
| R112 | | 4.7K ohm | 1 |
| R113 | | 47K ohm | 1 |
| R121 | | 22 ohm ½W, Flame Proof | 1 |
| R122 | | 12K ohm | 1 |
| R123 | | 4.7K ohm | 1 |
| R124 | | 470K ohm | 1 |
| R125 | | 3.9K ohm | 1 |
| R126 | | 47K ohm | 1 |
| R127 | | 1K ohm | 1 |
| R128 | | 4.7K ohm | 1 |
| R129 | | 47K ohm | 1 |
| R130 | | 18K ohm | 1 |
| R131 | | 8.2K ohm | 1 |
| R132 | | 1K ohm | 1 |
| R133 | | 33K ohm | 1 |
| R134 | | 4.7K ohm | 1 |
| | **CAPACITORS** | | |
| C101 | | Electrolytic 10μF 25V | 1 |
| C102 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C103 | | Electrolytic 47μF 25V | 1 |
| C104 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C105 | | Electrolytic 47μF 25V | 1 |
| C106 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C107 | | Electrolytic 0.22μF 50V | 1 |
| C108 | | Mylar 0.0047μF ±5% 50V | 1 |
| C109 | | Mylar 0.22μF ±10% 50V | 1 |
| C121 | | Tantal 10μF ±20% 10V | 1 |
| C122 | | Mylar 0.01μF ±5% 50V | 1 |
| C123 | | Mylar 0.01μF ±5% 50V | 1 |
| C124 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C125 | | Electrolytic 47μF 25V | 1 |
| C126 | | Electrolytic 47μF 25V | 1 |
| **SERVO & EQUALIZER P. C. B. ASS'Y** | | | |
| 82 | 141-4-250T-90100 | P.C.B. Ass'y, Servo & Equalizer | 1 |
| IC201 | | Integrated Circuit, LA9100 | 1 |
| IC241 | | Integrated Circuit, LA6324 | 1 |
| IC261 | | Integrated Circuit, LA9010 | 1 |
| IC281 | | Integrated Circuit, LA6458D | 1 |
| Q201,205 | | Transistor, 2SD438E | 2 |
| Q202,206 | | Transistor, 2SB560E | 2 |
| Q203,207 | | Transistor, 2SD613E | 2 |
| Q204,208 | | Transistor, 2SB633E | 2 |
| Q261 | | Transistor, 2SC930E | 1 |
| Q281 | | Transistor, 2SD600E | 1 |
| Q282 | | Transistor, 2SB631E | 1 |
| D241,242 | | Diode, GMA01 | 2 |
| D281 | | Diode, GMA01 | 1 |
| L261,262 | 4-284T-00600 | Delay Line | 2 |
| L281 | 4-252T-13200 | Choke Coil, 100μH | 1 |
| | 123-2-471R-10400 | Bead Core, Q261 mtg. | 1 |
| 69 | 141-2-327T-26100 | Insulator | 4 |
| 70 | 141-2-243T-09800 | Base | 4 |
| 71 | 141-2-368T-26701 | Heat Sink | 2 |
| TP | 141-2-382T-21000 | Terminal, Test Point | 4 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **SERVO & EQUALIZER P. C. B. ASS'Y** | | | |
| | 4-236T-13471 | Plug, 2p, Lamp | 1 |
| CNP 3 | 4-236T-19773 | Plug, 5p | 1 |
| CNP 4, 25, | 4-236T-19771 | Plug, 3p (TP 10) | 3 |
| CNP 5, 12 | 4-236T-19700 | Plug, 2p | 2 |
| CNP 6, 24 | 4-236T-19772 | Plug, 4p | 2 |
| CNS 7 | 4-240T-46000 | Socket, 2p | 1 |
| CNP 8 | 4-236T-19778 | Plug, 10p | 1 |
| TP 9 | 4-236T-19774 | Plug, 6p | 1 |
| TP | 4-236T-10293 | Plug, 2p | 2 |
| TP 1, 5, 13 | 4-237T-09000 | Terminal Board | 3 |
| SVR201 | 4-220T-05082 | Semi-Fixed Resistor, 10K ohm | 1 |
| SVR202 | 4-220T-05085 | Semi-Fixed Resistor, 33K ohm | 1 |
| SVR203 | 4-220T-05082 | Semi-Fixed Resistor, 10K ohm | 1 |
| SVR261 | 4-220T-05082 | Semi-Fixed Resistor, 10K ohm | 1 |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type 1/6W, ±5% unless otherwise noted. | | |
| R202 | | 1.8K ohm | 1 |
| R203 | | 47K ohm | 1 |
| R204 | | 2.2K ohm | 1 |
| R205 | | 56K ohm | 1 |
| R206 | | 2.7K ohm | 1 |
| R207 | | 2.2K ohm | 1 |
| R208 | | 39K ohm | 1 |
| R209 | | 1K ohm | 1 |
| R210 | | 82K ohm | 1 |
| R211 | | 33K ohm | 1 |
| R212 | | 100K ohm | 1 |
| R213 | | 2.2K ohm | 1 |
| R214 | | 820 ohm | 1 |
| R215 | | 10K ohm | 1 |
| R216 | | 470 ohm | 1 |
| R217 | | 2.7K ohm | 1 |
| R218 | | 82K ohm | 1 |
| R219 | | 3.3K ohm | 1 |
| R220 | | 270 ohm | 1 |
| R221 | | 2.2K ohm | 1 |
| R222 | | 2.2K ohm | 1 |
| R223 | | 2.2 ohm ½W, Flame Proof | 1 |
| R224 | | 2.2 ohm ½W, Flame Proof | 1 |
| R225 | | 39K ohm | 1 |
| R226 | | 47K ohm | 1 |
| R227 | | 1K ohm | 1 |
| R228 | | 8.2K ohm | 1 |
| R229 | | 3.3K ohm | 1 |
| R230 | | 270 ohm | 1 |
| R231 | | 2.2K ohm | 1 |
| R232 | | 2.2K ohm | 1 |
| R233 | | 2.2 ohm ½W, Flame Proof | 1 |
| R234 | | 2.2 ohm ½W, Flame Proof | 1 |
| R236 | | 5.6K ohm | 1 |
| R238 | | 2.7K ohm | 1 |
| R239 | | 3.9K ohm | 1 |
| R241 | | 56K ohm | 1 |
| R242 | | 56K ohm | 1 |
| R243 | | 27K ohm | 1 |
| R244 | | 12K ohm | 1 |
| R245 | | 120K ohm | 1 |
| R246 | | 39K ohm | 1 |
| R247 | | 1K ohm | 1 |
| R248 | | 100K ohm | 1 |
| R249 | | 5.6K ohm | 1 |
| R250 | | 5.6K ohm | 1 |
| R251 | | 10K ohm | 1 |
| R252 | | 10K ohm | 1 |
| R258 | | 10K ohm | 1 |
| R259 | | 12K ohm | 1 |
| R261 | | 3.3K ohm | 1 |
| R262 | | 1K ohm | 1 |
| R263 | | 1K ohm | 1 |
| R264 | | 1K ohm | 1 |
| R265 | | 1K ohm | 1 |
| R266 | | 1.2K ohm | 1 |
| R267 | | 1K ohm | 1 |
| R268 | | 1K ohm | 1 |
| R269 | | 4.7K ohm | 1 |
| R270 | | 100 ohm | 1 |
| R271 | | 56 ohm | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **SERVO & EQUALIZER P. C. B. ASS'Y** | | | |
| | **RESISTORS** | | |
| R272 | | 10K ohm | 1 |
| R273 | | 1K ohm | 1 |
| R281 | | 180K ohm | 1 |
| R282 | | 12K ohm | 1 |
| R283 | | 12K ohm | 1 |
| R284 | | 56K ohm | 1 |
| R285 | | 33K ohm | 1 |
| R286 | | 10K ohm | 1 |
| R287 | | 10K ohm | 1 |
| R289 | | 1K ohm | 1 |
| R291 | | 120 ohm 1W, Metal Oxide | 1 |
| | **CAPACITORS** | | |
| C201 | | Polypropylene 0.01μF ±5% 100V | 1 |
| C202 | | Polypropylene 0.01μF ±5% 100V | 1 |
| C203 | | Ceramic 33pF ±5% 50V | 1 |
| C204 | | Styrol 120pF ±5% 50V | 1 |
| C205 | | Styrol 120pF ±5% 50V | 1 |
| C206 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C207 | | Mylar 0.0068μF ±5% 50V | 1 |
| C208 | | Electrolytic 0.47μF (NPO) 50V | 1 |
| C209 | | Mylar 0.0068μF ±5% 50V | 1 |
| C210 | | Mylar 0.0068μF ±5% 50V | 1 |
| C211 | | Mylar 0.0047μF ±5% 50V | 1 |
| C212 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C213 | | Mylar 0.022μF ±5% 50V | 1 |
| C214 | | Mylar 0.047μF ±5% 50V | 1 |
| C215 | | Mylar 0.15μF ±10% 50V | 1 |
| C216 | | Electrolytic 10μF (NPO) 25V | 1 |
| C217 | | Electrolytic 47μF 16V | 1 |
| C218 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C219 | | Electrolytic 47μF 16V | 1 |
| C220 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C222 | | Electrolytic 1μF (NPO) 50V | 1 |
| C224 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C225 | | Mylar 0.001μF ±5% 50V | 1 |
| C226 | | Mylar 470pF ±10% 50V | 1 |
| C227 | | Electrolytic 4.7μF (NPO) 50V | 1 |
| C231 | | Electrolytic 100μF 16V | 1 |
| C232 | | Electrolytic 100μF 16V | 1 |
| C241 | | Electrolytic 0.47μF (NPO) 50V | 1 |
| C242 | | Electrolytic 1μF (NPO) 50V | 1 |
| C243 | | Electrolytic 0.47μF (NPO) 50V | 1 |
| C244 | | Electrolytic 1μF (NPO) 50V | 1 |
| C245 | | Electrolytic 0.47μF (NPO) 50V | 1 |
| C246 | | Electrolytic 0.47μF (NPO) 50V | 1 |
| C261 | | Polypropylene 0.033μF ±5% 100V | 1 |
| C262 | | Ceramic 33pF ±5% 50V | 1 |
| C263 | | Polypropylene 0.033μF ±5% 100V | 1 |
| C264 | | Ceramic 120pF ±10% 50V | 1 |
| C265 | | Ceramic 56pF ±5% 50V | 1 |
| C266 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C267 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C268 | | Electrolytic 4.7μF 25V | 1 |
| C269 | | Electrolytic 2.2μF 25V | 1 |
| C270 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C271 | | Mylar 0.033μF ±5% 50V | 1 |
| C272 | | Electrolytic 4.7μF (NPO) 25V | 1 |
| C273 | | Mylar 0.022μF ±5% 50V | 1 |
| C274 | | Ceramic 0.1μF ±10% 25V BC-type | 1 |
| C275 | | Electrolytic 47μF 16V | 1 |
| C276 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C277 | | Electrolytic 47μF 16V | 1 |
| C278 | | Ceramic 0.01μF +80–20% 50V | 1 |
| C281 | | Mylar 0.012μF ±5% 50V | 1 |
| C282 | | Mylar 0.056μF ±5% 50V | 1 |
| C283 | | Ceramic 0.1μF ±10% 25V BC-type | 1 |
| C284 | | Mylar 0.0022μF ±5% 50V | 1 |
| C285 | | Electrolytic 1μF 50V | 1 |
| C286 | | Electrolytic 47μF 16V | 1 |
| C287 | | Electrolytic 47μF 16V | 1 |
| C288 | | Electrolytic 47μF 16V | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| • The printed circuits boards (assembly) for digital audio use are of two types, A and B. When the number of the printed circuit board is 4-250T-91200, use the 141-4-250T-91200 parts list, and when it is 4-250T-90200, use the 141-4-250T-90200 parts list. (see page 42) | | | |
| **DIGITAL AUDIO P. C. B. ASS'Y (A)** | | | |
| 83 | 141-4-250T-91200 | P.C.B. Ass'y, Digital Audio (NEW) | 1 |
| IC501 | | Integrated Circuit μPD1511C–144 | 1 |
| IC502 | | Integrated Circuit LC4001B | 1 |
| IC503 | | Integrated Circuit M54539P | 1 |
| IC504 | | Integrated Circuit LC4011B | 1 |
| IC601 | | Integrated Circuit MB62131 | 1 |
| IC602 | | Integrated Circuit CX7933 | 1 |
| IC603 | | Integrated Circuit CX7934 | 1 |
| IC604 | | Integrated Circuit CX7935 | 1 |
| IC605 | | Integrated Circuit MB8128–15 | 1 |
| IC608 | | Integrated Circuit M74LS00P | 1 |
| IC609 | | Integrated Circuit N74LS02P | 1 |
| IC701 | | Integrated Circuit CX20017 | 1 |
| IC702,703 | | Integrated Circuit LF353N | 2 |
| IC704 | | Integrated Circuit μPD4053BC | 1 |
| IC705,706 | | Integrated Circuit F113A | 2 |
| IC707 | | Integrated Circuit NJM5532DA or NE5532AP | 1 |
| IC708 | | Integrated Circuit NJM4556D | 1 |
| IC709 | | Integrated Circuit NJM78M05A | 1 |
| IC710 | | Integrated Circuit NJM79M05A | 1 |
| Q501 | | Transistor 2SC536 AUD G | 1 |
| Q502 | | Transistor 2SB560E | 1 |
| Q511,512, 513,514, 515 | | Transistor 2SC536 AUD G | 5 |
| Q551 | | Transistor 2SC536 AUD G | 1 |
| Q552,553, 554,555 | | Transistor 2SA984E | 4 |
| Q601 | | FET 2SK222E | 1 |
| Q602,603, 604 | | Transistor 2SC930E | 3 |
| Q701,702 | | FET 2SK152 (3) or 2SK152 (4) | 2 |
| Q801,802 | | Transistor 2SC536 AUD KG | 2 |
| D511,521 | | Diode GMA01 | 2 |
| D601 | | Diode 1SV53A | 1 |
| D701,702 | | Diode GZA6.2Y | 2 |
| D801,802 | | Diode GMA01 | 2 |
| L501 | 4-253T-12720 | Filter 10μH | 1 |
| L602,603 | 4-253T-14828 | Filter 47μH | 2 |
| L604 | 4-253T-12714 | Filter 3.3μH | 1 |
| L701 | 4-253R-11100 | Choke Coil, 1μH | 1 |
| T601 | 4-256T-30430 | I. F. T. | 1 |
| X501 | 4-266T-00400 | Ceramic Resonator, 3.58MHz | 1 |
| X601 | 4-225T-04200 | Crystal, 8.6436MHz | 1 |
| X701 | 4-225T-05300 | Crystal, 35.002MHz | 1 |
| RY801,802 | 4-232T-06600 | Relay | 2 |
| CNP 7,20 | 4-236T-19700 | Plug, 2p | 2 |
| CNP 8 | 4-236T-19778 | Plug, 10p | 1 |
| CNP 9 | 4-236T-19777 | Plug, 9p | 1 |
| CNP 15,17 | 4-236T-19771 | Plug, 3p | 2 |
| CNP 16,22 | 4-236T-19774 | Plug, 6p | 2 |
| CNP 18 | 4-236T-19776 | Plug, 8p | 1 |
| CNS 21 | 4-240T-46700 | Socket, 4p | 1 |
| TP 6 | 4-236T-19772 | Plug, 4p | 1 |
| TP | 141-2-382T-21000 | Terminal | 11 |
| | 4-237T-11200 | Terminal Board | 2 |
| RA501 | 4-221T-07776 | Resistor, 10K ohm x 9 | 1 |
| RA502 | 4-221T-07773 | Resistor, 10K ohm x 6 | 1 |
| RA503 | 4-221T-07777 | Resistor, 10K ohm x 10 | 1 |
| SVR501 | 4-220T-04986 | Semi-fixed Resistor 47K ohm | 1 |
| SVR601 | 4-220T-04974 | Semi-fixed Resistor 470 ohm | 1 |
| SVR701,702 | 4-220T-04984 | Semi-fixed Resistor 22K ohm | 2 |
| | **RESISTORS** All Resistors are Carbon P-type 1/6W, ±5% unless otherwise noted. | | |
| R501 | | 10K ohm | 1 |
| R502 | | 10K ohm | 1 |
| R503 | | 220 ohm | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| DIGITAL AUDIO P. C. B. ASS'Y (A) | | | |
| | **RESISTORS** | | |
| R504 | | 10K ohm | 1 |
| R505 | | 1K ohm | 1 |
| R506 | | 1K ohm | 1 |
| R507 | | 27 ohm 2W, Metal Oxide | 1 |
| R508 | | 1K ohm | 1 |
| R511 | | 82K ohm | 1 |
| R512 | | 10K ohm | 1 |
| R513 | | 10K ohm | 1 |
| R514 | | 10K ohm | 1 |
| R515 | | 47K ohm | 1 |
| R516 | | 22K ohm | 1 |
| R517 | | 47K ohm | 1 |
| R518 | | 47K ohm | 1 |
| R521 | | 47K ohm | 1 |
| R522 | | 10K ohm | 1 |
| R551 | | 33K ohm | 1 |
| R552 | | 1K ohm | 1 |
| R553 | | 1K ohm | 1 |
| R554 | | 1K ohm | 1 |
| R555 | | 1K ohm | 1 |
| R556 | | 1K ohm | 1 |
| R557 | | 1K ohm | 1 |
| R558 | | 1K ohm | 1 |
| R559 | | 1K ohm | 1 |
| R560 | | 10K ohm | 1 |
| R561 | | 10K ohm | 1 |
| R562 | | 10K ohm | 1 |
| R563 | | 10K ohm | 1 |
| R601 | | 3.3K ohm | 1 |
| R602 | | 3.9K ohm | 1 |
| R603 | | 1K ohm | 1 |
| R604 | | 10K ohm | 1 |
| R605 | | 1K ohm | 1 |
| R606 | | 150 ohm | 1 |
| R607 | | 1K ohm | 1 |
| R608 | | 33K ohm | 1 |
| R609 | | 12K ohm | 1 |
| R610 | | 2.2K ohm | 1 |
| R611 | | 39K ohm | 1 |
| R612 | | 8.2K ohm | 1 |
| R613 | | 560 ohm | 1 |
| R614 | | 100 ohm | 1 |
| R615 | | 820 ohm | 1 |
| R616 | | 10K ohm | 1 |
| R701 | | 100 ohm | 1 |
| R702 | | 82K ohm | 1 |
| R703 | | 2.7K ohm | 1 |
| R704 | | 4.7K ohm | 1 |
| R705 | | 4.7K ohm | 1 |
| R711,712 | | 15K ohm ±1% ¼W Metal | 2 |
| R713,714 | | 18K ohm ±1% ¼W Metal | 2 |
| R715,716 | | 4.7K ohm ±1% ¼W Metal | 2 |
| R717,718 | | 15K ohm ±1% ¼W Metal | 2 |
| R719,720 | | 4.7K ohm ±1% ¼W Metal | 2 |
| R721,722 | | 1.8K ohm ±1% ¼W Metal | 2 |
| R723,724 | | 12K ohm ±1% ¼W Metal | 2 |
| R725,726 | | 330 ohm ±1% ¼W Metal | 2 |
| R727,728 | | 150K ohm ±1% ¼W Metal | 2 |
| R729,739 | | 100K ohm ±1% ¼W Metal | 2 |
| R731,732 | | 470 ohm ±1% ¼W Metal | 2 |
| R733,734 | | 1K ohm | 2 |
| R735,736 | | 220K ohm | 2 |
| R737,738 | | 10K ohm | 2 |
| R739,740 | | 3.3K ohm | 2 |
| R741,742 | | 220 ohm ¼W Flame Proof | 2 |
| R751 | | 10 ohm ¼W Flame Proof | 1 |
| R752 | | 47 ohm 1W Metal Oxide | 1 |
| R801,803 | | 10K ohm | 2 |
| R802,804 | | 47K ohm | 2 |
| | **CAPACITORS** | | |
| C501 | | Ceramic 20pF ±5% 50V | 1 |
| C502 | | Ceramic 20pF ±5% 50V | 1 |
| C503 | | Mylar 0.033µF ±5% 50V | 1 |
| C504 | | Electrolytic 470µF 16V | 1 |
| C505 | | Electrolytic 100µF 10V | 1 |
| C506 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C507 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C511 | | Electrolytic 2.2µF 50V | 1 |
| C521 | | Mylar 0.0022µF ±5% 50V | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| DIGITAL AUDIO P. C. B. ASS'Y (A) | | | |
| | **CAPACITORS** | | |
| C551 | | Electrolytic 100µF 16V | 1 |
| C552 | | Electrolytic 100µF 16V | 1 |
| C553 | | Electrolytic 100µF 16V | 1 |
| C554 | | Electrolytic 100µF 16V | 1 |
| C601 | | Ceramic 39pF ±5% 50V | 1 |
| C602 | | Ceramic 39pF ±5% 50V | 1 |
| C603 | | Mylar 0.033µF ±5% 50V | 1 |
| C604 | | Mylar 0.0015µF ±5% 50V | 1 |
| C605 | | Ceramic 47pF ±5% 50V | 1 |
| C606 | | Ceramic 56pF ±5% 50V | 1 |
| C607 | | Ceramic 56pF ±5% 50V | 1 |
| C608 | | Ceramic 33pF ±5% 50V | 1 |
| C609 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C610 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C611 | | Electrolytic 470µF 10V | 1 |
| C612 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C613 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C614 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C615 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C616 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C617 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C618 | | Ceramic 0.01µF +80–20% 50V | 1 |
| C619 | | Electrolytic 100µF 10V | 1 |
| C620 | | Electrolytic 100µF 10V | 1 |
| C621 | | Ceramic 0.047µF +80–20% 50V | 1 |
| C622 | | Ceramic 0.047µF +80–20% 50V | 1 |
| C701 | | Electrolytic 33µF 16V | 1 |
| C702 | | Electrolytic 33µF 16V | 1 |
| C703 | | Electrolytic 1µF 50V | 1 |
| C704 | | Electrolytic 33µF 16V | 1 |
| C705 | | Electrolytic 4.7µF 25V | 1 |
| C706 | | Electrolytic 33µF 16V | 1 |
| C707 | | Ceramic 47pF ±5% 50V | 1 |
| C708 | | Ceramic 47pF ±5% 50V | 1 |
| C709 | | Ceramic 0.001µF ±10% 50V | 1 |
| C710 | | Ceramic 18pF ±5% 50V | 1 |
| C711,712 | 4-223T-14500 | Capacitor 0.001µF | 2 |
| C713,714 | | Electrolytic 1µF 50V | 2 |
| C715,716 | | Mica 68pF ±5% 500V | 2 |
| C717,718 | 4-223T-14300 | Capacitor 0.01µF | 2 |
| C719,720 | 4-163T-09400 | Electrolytic 4.7µF 50V AR | 2 |
| C721,722 | | Electrolytic 1µF (NPO) 50V | 2 |
| C751,752 | 4-163T-10300 | Electrolytic 22µF 25V AR | 2 |
| C753,754 | | Electrolytic 1µF 50V | 2 |
| C755,756 | | Electrolytic 100µF 10V | 2 |
| C757,758 | | Electrolytic 1µF 50V | 2 |
| C759,760 | 4-163T-10300 | Electrolytic 22µF 25V AR | 2 |
| C761,762 | 4-163T-10300 | Electrolytic 22µF 25V AR | 2 |
| C763,764 | 4-163T-10300 | Electrolytic 22µF 25V AR | 2 |
| C771 | | Ceramic 0.047µF +80–20% 50V | 1 |
| C775 | | Ceramic 0.047µF +80–20% 50V | 1 |
| SYSTEM CONTROL P. C. B. ASS'Y | | | |
| 84. There are 2 types of the IC401 used in the system control (PCB ass'y.) : LM6402H–175 and LM6402H–192. When replacing IC401, refer to the section "Replacement of IC401 LM6402H" on page 31. | | | |
| 84 | 141-4-250T-90300 | P.C.B. Ass'y, System Control | 1 |
| IC401 | | Integrated Circuit LM6402H–192 | 1 |
| IC402 | | Integrated Circuit BA6109 | 1 |
| Q401,403 | | Transistor 2SC536 AUD G | 2 |
| Q402,404 | | Transistor 2SD734 F | 2 |
| Q405 | | Transistor 2SA608 F | 1 |
| Q406,407, 408 | | Transistor 2SC536 AUD G | 3 |
| D401 | | Diode GZA5.1Y | 1 |
| D402 | | Diode GZA3.3Y | 1 |
| D403 | | Diode DS442 X | 1 |
| L401 | 4-253T-15020 | Filter 10µH | 1 |
| X401 | 4-266T-00100 | Ceramic Resonator | 1 |
| CNP 9 | 4-236T-19777 | Plug, 9P | 1 |
| CNP 13 | 4-236T-19700 | Plug, 2p | 1 |
| CNP 14 | 4-236T-19774 | Plug, 6p | 1 |
| CNP 23 | 4-236T-19776 | Plug, 8p | 1 |
| | 4-240T-44274 | Socket 7p Connection | 1 |
| | 4-240T-44287 | Socket 20p Connection | 1 |
| RA401 | 4-221T-07774 | Resistor 10K ohm x 7 | 1 |
| RA402 | 4-221T-07773 | Resistor 10K ohm x 6 | 1 |
| RA403 | 4-221T-07771 | Resistor 10K ohm x 4 | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| **SYSTEM CONTROL P. C. B. ASS'Y** | | | |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type ¼W, ±5% unless otherwise noted. | | |
| R401 | | 1M ohm | 1 |
| R402 | | 10K ohm | 1 |
| R403 | | 10K ohm | 1 |
| R404 | | 330 ohm | 1 |
| R405 | | 10 ohm 1W Metal Oxide | 1 |
| R406 | | 10K ohm | 1 |
| R407 | | 3.9K ohm | 1 |
| R408 | | 10K ohm | 1 |
| R409 | | 3.9K ohm | 1 |
| R410 | | 10K ohm | 1 |
| R411 | | 2.2K ohm | 1 |
| R412 | | 10K ohm | 1 |
| R413 | | 10K ohm | 1 |
| R414 | | 100 ohm | 1 |
| R415 | | 27K ohm | 1 |
| R416 | | 15K ohm | 1 |
| R417 | | 5.6K ohm | 1 |
| R418 | | 10K ohm | 1 |
| R419 | | 100K ohm | 1 |
| | **CAPACITORS** | | |
| C401 | | Cramic 220pF ±5% 50V | 1 |
| C402 | | Ceramic 220pF ±5% 50V | 1 |
| C403 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C404 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C405 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C406 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C407 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C408 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C409 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C410 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C411 | | Ceramic 0.012μF ±10% 25V BC-Type | 1 |
| C412 | | Ceramic 0.022μF +80—20% 50V | 1 |
| C413 | | Electrolytic 33μF 16V | 1 |
| C414 | | Electrolytic 2.2μF 50V | 1 |
| C415 | | Electrolytic 100μF 10V | 1 |
| C416 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C417 | | Electrolytic 47μF 50V | 1 |
| C418 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C419 | | Electrolytic 47μF 25V | 1 |
| C420 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C421 | | Ceramic 100pF ±5% 50V | 1 |
| **KEY SWITCH & DISPLAY P. C. B. ASS'Y** | | | |
| 85 | 141-4-250T-90400 | P.C.B. Ass'y, Key Switch & Display | 1 |
| IC301,302 | | Integrated Circuit LB1240 | 2 |
| IC303,304 | | Integrated Circuit LB1275 | 2 |
| LED301,302, 303 | | LED SLP973BB Red Music No. | 3 |
| LED304,305, 306,307, 308,309, 310,311, 312,313, 314,315 | | LED SLP953BB Red Operation | 12 |
| D301,302, 303,304, 305,306, 307,308, 309,310, 311,312, 313,314, 315,316, 317,318, 319,320, 321,322, 323,324, 325,326, 327 | | Diode DS442 X | 27 |
| | 4-985T-02600 | FL Display, COUNTER/ DISPLAY | 2 |
| | 4-236T-22974 | Plug 7p Connection | 1 |
| | 4-236T-22977 | Plug 10p Connection | 2 |
| 23 | 141-2-210T-44400 | Bracket, LED301,302,303 mtg. | 1 |
| 24 | 141-2-210T-44500 | Bracket, FL Display Meter | 2 |
| K1 ~ 27 | 4-238T-45700 | Switch, KEY SWITCH | 27 |
| RA301 | 4-221T-07774 | Resistor 10K ohm x 7 | 1 |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type ¼W, ±5% unless otherwise noted. | | |
| R301,302, 303,304, 305,306, 307,308, 309,310, 311,312, 313,314, 315 | | 100 ohm | 15 |
| | **CAPACITORS** | | |
| C301 | | Electrolytic 100μF 10V | 1 |
| C302 | | Ceramic 0.01μF +80—20% 50V | 1 |
| **LINE OUT SOCKET P. C. B. ASS'Y** | | | |
| 86 | 141-4-250T-90500 | P.C.B. Ass'y, Line out Socket | 1 |
| | 4-240T-35171 | Socket, Line out | 1 |
| CNS 17 | 4-240T-46400 | Socket, 3p | 1 |
| | 4-237T-11200 | Terminal Board | 1 |
| | **CAPACITORS** | | |
| C772 | | Ceramic 0.047μF +80—20% 50V | 1 |
| **PHONES LEVEL CONTROL P. C. B. ASS'Y** | | | |
| 87 | 141-4-250T-90600 | P.C.B. Ass'y, Phones Level Control | 1 |
| VR701,702 | 4-220T-09200 | Variable Resistor 50K ohm Phones Level Control | 2 |
| CNS 18 | 4-240T-46500 | Socket, 8p | 1 |
| **PHONES SOCKET P. C. B. ASS'Y** | | | |
| 88 | 141-4-250T-90700 | P.C.B. Ass'y, Phones Socket | 1 |
| | 4-240T-09171 | Socket, Phones | 1 |
| **POWER SUPPLY P. C. B. ASS'Y** | | | |
| 89 | 141-4-250T-90871 | P.C.B. Ass'y, Power Supply | 1 |
| IC902 | | Integrated Circuit NJM78M15A | 1 |
| IC903 | | Integrated Circuit NJM79M15A | 1 |
| IC904 | | Integrated Circuit NJM78M09A | 1 |
| IC905 | | Integrated Circuit NJM79M09A | 1 |
| Q901 | | Transistor 2SA984E or 2SB560E | 1 |
| D901 | 4-202T-05400 | ⚠Diode DBA30C K12 | 1 |
| D902 | | ⚠Diode DBA10C | 1 |
| D903 | 4-202T-05500 | ⚠Diode DBA20C K15 | 1 |
| D904,905, 906,907, 908,909 | | ⚠Diode DS F10C | 6 |
| D910 | | Diode GZA13Y | 1 |
| D911 | | Diode GZA2.4Z | 1 |
| D912 | | Diode DS442 X | 1 |
| CNP 21 | 4-236T-19772 | Plug 4p (NEW) | 1 |
| CNS 21 | 4-240T-46700 | Socket, 4p (OLD) | 1 |
| CNS 22 | 4-240T-47300 | Socket, 6p (NEW) | 1 |
| CNS 22 | 4-240T-46800 | Socket, 5p (OLD) | 1 |

## POWER SUPPLY P. C. B. ASS'Y

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| CNS 23 | 4-240T-47000 | Socket 8p | 1 |
| CNS 24 ,25 | 4-240T-46900 | Socket 4+3p | 1 |
| 72 | 141-2-368T-27100 | Heat Sink | 2 |
| | 141-2-381T-04200 | Bracket Fuse | 10 |
| | 4-237T-00100 | Terminal Board | 11 |
| | 4-237T-11200 | Terminal Board | 1 |
| | 141-2-327T-26100 | Insulator | 1 |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type ¼W, ±5% unless otherwise noted. | | |
| R901 | | 2.2K ohm | 1 |
| R902 | | 2.2K ohm | 1 |
| | **CAPACITORS** | | |
| C901 | | Mylar 0.1µF ±20% 50V | 1 |
| C902 | | Ceramic 0.01µF +80—20% 50V | 1 |
| C903 | | Ceramic 0.01µF +80—20% 50V | 1 |
| C904 | | Ceramic 0.01µF +80—20% 50V | 1 |
| C905 | | Ceramic 0.01µF +80—20% 50V | 1 |
| C906 | | Mylar 0.01µF ±20% 250V | 1 |
| C907 | | Mylar 0.01µF ±20% 250V | 1 |
| C908 | 4-163T-10600 | Electrolytic 6800µF 16V | 1 |
| C909 | | Mylar 0.1µF ±20% 50V | 1 |
| C910 | | Mylar 0.1µF ±20% 50V | 1 |
| C911 | | Electrolytic 1µF 50V | 1 |
| C912 | | Electrolytic 1000µF 16V | 1 |
| C913 | 4-163T-10500 | Electrolytic 470µF 25V AR | 1 |
| C914 | 4-163T-09200 | Electrolytic 1000µF 25V AR | 1 |
| C915 | | Electrolytic 1µF 50V | 1 |
| C916 | | Electrolytic 1µF 50V | 1 |
| C917 | 4-163T-09200 | Electrolytic 1000µF 25V AR | 1 |
| C918 | 4-163T-09200 | Electrolytic 1000µF 25V AR | 1 |
| C919 | | Electrolytic 2200µF 16V | 1 |
| C920 | | Electrolytic 2200µF 16V | 1 |
| C921 | | Electrolytic 1µF 50V | 1 |
| C922 | | Electrolytic 1µF 50V | 1 |
| C923 | | Electrolytic 1000µF 16V | 1 |
| C924 | | Electrolytic 1000µF 16V | 1 |
| C925 | | Electrolytic 220µF 35V | 1 |
| C926 | | Electrolytic 220µF 35V | 1 |
| C927 | | Electrolytic 2.2µF 50V | 1 |
| C928 | | Electrolytic 47µF 25V | 1 |

## POWER SWITCH P. C. B. ASS'Y

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| 90 | 141-4-250T-90971 | P.C.B. Ass'y, Power Switch | 1 |
| S901 | 4-238T-64200 | ⚠ Switch, Power | 1 |
| | 4-237T-00100 | Terminal Board | 2 |
| | 141-2-382T-18900 | Terminal | 2 |
| C929 | 4-223T-12100 | ⚠ Capacitor, 400V | 1 |
| | 141-2-135T-75700 | Cover, Capacitor mtg. | 1 |

## PICK-UP FIXING SWITCH P. C. B. ASS'Y

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| 91 | 141-4-250T-91000 | P.C.B. Ass'y, Pick-Up Fixing Switch | 1 |
| S501 | 4-238T-66400 | Switch, Pick-Up Fixing | 1 |
| CNS 20 | 4-240T-47200 | Socket, 2p | 1 |

## POWER SUPPLY (IC901) P. C. B. ASS'Y

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| 92 | 141-4-250T-91100 | P.C.B. Ass'y, Power Supply (IC901) | 1 |
| IC901 | | Integrated Circuit NJM7805A | 1 |
| | **CAPACITORS** | | |
| C951 | | Electrolytic 1µF 50V | 1 |
| C952 | | Electrolytic 1µF 50V | 1 |

## LINE FILTER P. C. B. ASS'Y

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| 93 | 141-4-250T-91300 | P.C.B. Ass'y, Line Filter | 1 |
| L951 | 4-253T-15800 | ⚠ Filter 600µH | 1 |
| C951,952 | 4-223T-12171 | ⚠ Capacitor 0.0047µF | 2 |
| C953 | 4-223T-24500 | ⚠ Capacitor 0.047µF | 1 |
| | 141-2-382T-18900 | Terminal | 4 |

## DIGITAL AUDIO P. C. B. ASS'Y (B)

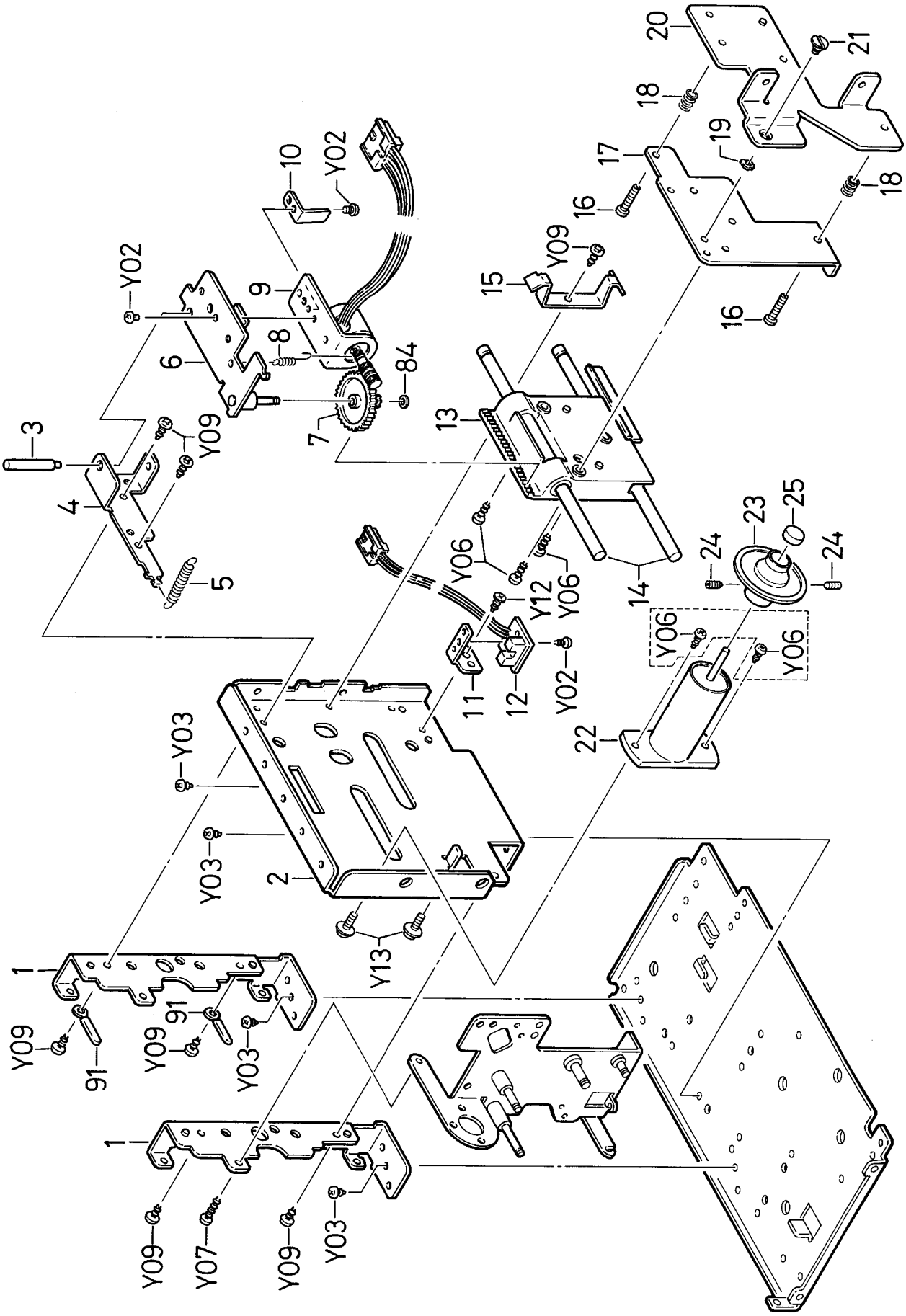
| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| 83 | 141-4-250T-90200 | P.C.B. Ass'y, Digital Audio (OLD) | 1 |
| IC501 | | Integrated Circuit µPD1511C—104 | 1 |
| IC502 | | Integrated Circuit LC4001B | 1 |
| IC503 | | Integrated Circuit M54539P | 1 |
| IC504 | | Integrated Circuit LC4011B | 1 |
| IC601 | | Integrated Circuit MB62131 | 1 |
| IC602 | | Integrated Circuit CX7933 | 1 |
| IC603 | | Integrated Circuit CX7934 | 1 |
| IC604 | | Integrated Circuit CX7935 | 1 |
| IC605 | | Integrated Circuit MB8128-15 | 1 |
| IC606 | | Integrated Circuit PCM51JG-V | 1 |
| IC607 | | Integrated Circuit LM310N | 1 |
| IC608 | | Integrated Circuit M74LS00P | 1 |
| IC609 | | Integrated Circuit M74LS02P | 1 |
| IC610 | | Integrated Circuit µPD4053BC | 1 |
| IC701,702 | | Integrated Circuit LF356N | 2 |
| IC703,704 | | Integrated Circuit F113A | 2 |
| IC705 | | Integrated Circuit NE5532AP | 1 |
| IC706 | | Integrated Circuit NJM4556D | 1 |
| Q501 | | Transistor 2SC536 AUD G | 1 |
| Q502 | | Transistor 2SB560E | 1 |
| Q511,512 513,514, 515 | | Transistor 2SC536 AUD G | 5 |
| Q551 | | Transistor 2SC536 AUD G | 1 |
| Q552,553, 554,555 | | Transistor 2SA984E | 4 |
| Q601 | | FET 2SK222E | 1 |
| Q602,603, 604 | | Transistor 2SC930E | 3 |
| Q801,802 | | Transistor 2SC536 AUD KG | 2 |
| D511,521 | | Diode DS442X | 2 |
| D601 | | Diode 1SV53A | 1 |
| D621,622 | | Diode GZA5.1Y | 2 |
| D801,802 | | Diode DS442X | 2 |
| L501 | 4-253T-12720 | Filter 10µH | 1 |
| L601,602 | 4-253T-14828 | Filter 47µH | 2 |
| L604 | 4-253T-12714 | Filter 3.3µH | 1 |
| L603 | 4-256T-30430 | I. F. T. | 1 |
| X501 | 4-266T-00400 | Ceramic Resonator 3.58MHz | 1 |
| X601 | 4-225T-04200 | Crystal 8.6436MHz | 1 |
| RY801,802 | 4-232T-06600 | Relay | 2 |
| CNP 7,20 | 4-236T-19700 | Plug 2p | 2 |
| CNP 8 | 4-236T-19778 | Plug 10p | 1 |
| CNP 9 | 4-236T-19777 | Plug 9p | 1 |
| CNP 15,17 | 4-236T-19771 | Plug 3p | 2 |
| CNP 16 | 4-236T-19774 | Plug 6p | 1 |
| CNP 18 | 4-236T-19776 | Plug 8p | 1 |
| CNS 21 | 4-240T-46700 | Socket 4p | 1 |
| CNP 22 | 4-236T-19773 | Plug 5p | 1 |
| TP 6 | 4-236T-19772 | Plug 4p | 1 |
| TP | 141-2-382T-21000 | Terminal | 9 |
| RA501 | 4-221T-07776 | Resistor 10K ohm x 9 | 1 |
| RA502 | 4-221T-07773 | Resistor 10K ohm x 6 | 1 |
| RA503 | 4-221T-07777 | Resistor 10K ohm x 10 | 1 |
| SVR501 | 4-220T-04986 | Semi-fixed Resistor 47K ohm | 1 |
| SVR601 | 4-220T-04974 | Semi-fixed Resistor 470 ohm | 1 |

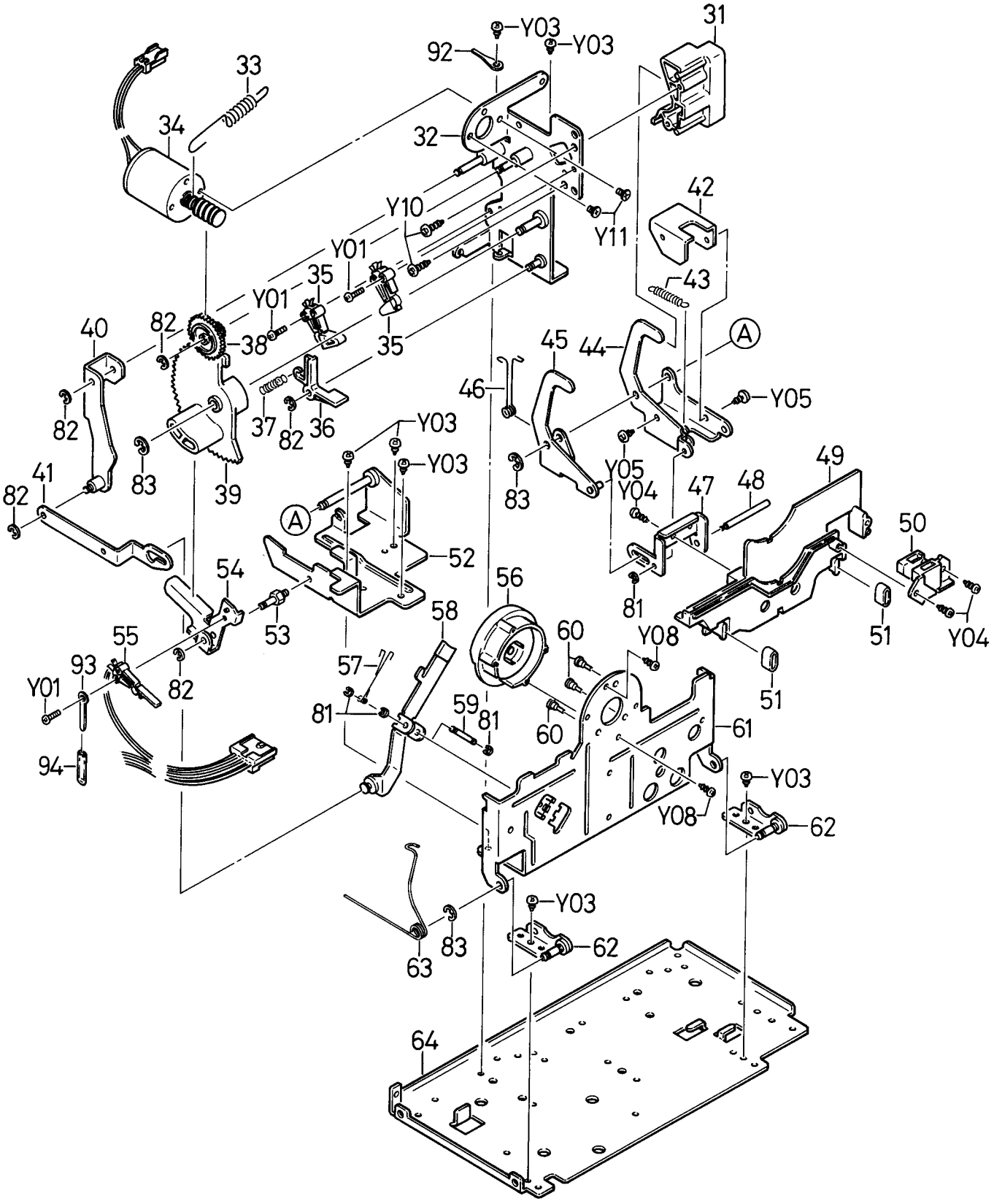
| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| DIGITAL AUDIO P. C. B. ASS'Y | | | |
| | **RESISTORS** | | |
| | All Resistors are Carbon P-type 1/6W, ±5% unless otherwise noted. | | |
| R501 | | 10K ohm ¼W | 1 |
| R502 | | 10K ohm ¼W | 1 |
| R503 | | 220 ohm ¼W | 1 |
| R504 | | 10K ohm | 1 |
| R505 | | 1K ohm | 1 |
| R506 | | 1K ohm | 1 |
| R507 | | 27 ohm 2W, Metal Oxide | 1 |
| R508 | | 1K ohm ¼W | 1 |
| R511 | | 82K ohm | 1 |
| R512 | | 10K ohm | 1 |
| R513 | | 10K ohm | 1 |
| R514 | | 10K ohm | 1 |
| R515 | | 47K ohm | 1 |
| R516 | | 22K ohm | 1 |
| R517 | | 47K ohm | 1 |
| R518 | | 47K ohm | 1 |
| R521 | | 47K ohm ¼W | 1 |
| R522 | | 10K ohm ¼W | 1 |
| R551 | | 33K ohm | 1 |
| R552 | | 1K ohm | 1 |
| R553 | | 1K ohm | 1 |
| R554 | | 1K ohm | 1 |
| R555 | | 1K ohm | 1 |
| R556 | | 1K ohm | 1 |
| R557 | | 1K ohm | 1 |
| R558 | | 1K ohm | 1 |
| R559 | | 1K ohm | 1 |
| R560 | | 10K ohm | 1 |
| R561 | | 10K ohm | 1 |
| R562 | | 10K ohm | 1 |
| R563 | | 10K ohm | 1 |
| R601 | | 3.3K ohm ¼W | 1 |
| R602 | | 3.9K ohm ¼W | 1 |
| R603 | | 1K ohm | 1 |
| R604 | | 10K ohm | 1 |
| R605 | | 1K ohm | 1 |
| R606 | | 150 ohm | 1 |
| R607 | | 1K ohm | 1 |
| R608 | | 33K ohm | 1 |
| R609 | | 12K ohm | 1 |
| R610 | | 2.2K ohm | 1 |
| R611 | | 39K ohm | 1 |
| R612 | | 8.2K ohm | 1 |
| R613 | | 560 ohm | 1 |
| R614 | | 100 ohm | 1 |
| R615 | | 820 ohm | 1 |
| R616 | | 10K ohm | 1 |
| R621 | | 1K ohm ¼W | 1 |
| R622 | | 1K ohm ¼W | 1 |
| R701,702 | | 4.7K ohm ±1% ¼W Metal | 2 |
| R703,704 | | 4.7K ohm ±1% ¼W Metal | 2 |
| R705,706 | | 4.7K ohm ±1% ¼W Metal | 2 |
| R707,708 | | 1.8K ohm ±1% ¼W Metal | 2 |
| R709,710 | | 12K ohm ±1% ¼W Metal | 2 |
| R711,712 | | 330 ohm ±1% ¼W Metal | 2 |
| R713,714 | | 150K ohm ±1% ¼W Metal | 2 |
| R715,716 | | 100K ohm ±1% ¼W Metal | 2 |
| R717,718 | | 470 ohm ±1% ¼W Metal | 2 |
| R719,720 | | 1K ohm ¼W | 2 |
| R721,722 | | 220K ohm ¼W | 2 |
| R723,724 | | 2.2K ohm ¼W | 2 |
| R725,726 | | 10K ohm ¼W | 2 |
| R727,728 | | 220 ohm ¼W Flame Proof | 2 |
| R801,803 | | 10K ohm ¼W | 2 |
| R802,804 | | 47K ohm ¼W | 2 |
| | **CAPACITORS** | | |
| C501 | | Ceramic 20pF ±5% 50V | 1 |
| C502 | | Ceramic 20pF ±5% 50V | 1 |
| C503 | | Mylar 0.033μF ±5% 50V | 1 |
| C504 | | Electrolytic 470μF 16V | 1 |
| C505 | | Electrolytic 100μF 10V | 1 |
| C506 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C507 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C511 | | Electrolytic 2.2μF 50V | 1 |
| C521 | | Mylar 0.0022μF ±5% 50V | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| DIGITAL AUDIO P. C. B. ASS'Y | | | |
| | **CAPACITORS** | | |
| C551 | | Electrolytic 100μF 16V | 1 |
| C552 | | Electrolytic 100μF 16V | 1 |
| C553 | | Electrolytic 100μF 16V | 1 |
| C554 | | Electrolytic 100μF 16V | 1 |
| C601 | | Ceramic 39pF ±5% 50V | 1 |
| C602 | | Ceramic 39pF ±5% 50V | 1 |
| C603 | | Mylar 0.033μF ±5% 50V | 1 |
| C604 | | Mylar 0.0015μF ±5% 50V | 1 |
| C605 | | Ceramic 47pF ±5% 50V | 1 |
| C606 | | Ceramic 56pF ±5% 50V | 1 |
| C607 | | Ceramic 56pF ±5% 50V | 1 |
| C608 | | Ceramic 33pF ±5% 50V | 1 |
| C609 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C610 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C611 | | Electrolytic 470μF 16V | 1 |
| C612 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C613 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C614 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C615 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C616 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C617 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C618 | | Ceramic 0.01μF +80—20% 50V | 1 |
| C619 | | Electrolytic 100μF 10V | 1 |
| C620 | | Electrolytic 100μF 10V | 1 |
| C621 | 4-163T-10300 | Electrolytic 22μF 25V AR | 1 |
| C622 | 4-163T-10300 | Electrolytic 22μF 25V AR | 1 |
| C623 | | Electrolytic 47μF 16V | 1 |
| C624 | | Electrolytic 47μF 16V | 1 |
| C701,702 | 4-223T-14400 | Capacitor 680pF | 2 |
| C703,704 | 4-223T-14300 | Capacitor 0.01μF | 2 |
| C705,706 | 4-163T-09400 | Electrolytic 4.7μF 50V AR | 2 |
| C707,708 | | Electrolytic 1μF (NPO) 50V | 2 |
| C709,710 | 4-163T-10300 | Electrolytic 22μF 25V AR | 2 |
| C711,712 | 4-163T-10300 | Electrolytic 22μF 25V AR | 2 |
| C713,714 | 4-163T-10300 | Electrolytic 22μF 25V AR | 2 |

Safety notice:
All parts bearing the ⚠ symbol were manufactured to conform to special safety standards. When replacing, do not use parts numbers other than those specified.

## 17. MECHANISM EXPLODED VIEWS




Y03
92
Y03
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Y10
Y11
Y01
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Y01
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38
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Y05
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Y03
Y03
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Y01
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Y03
Y08
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83
Y03
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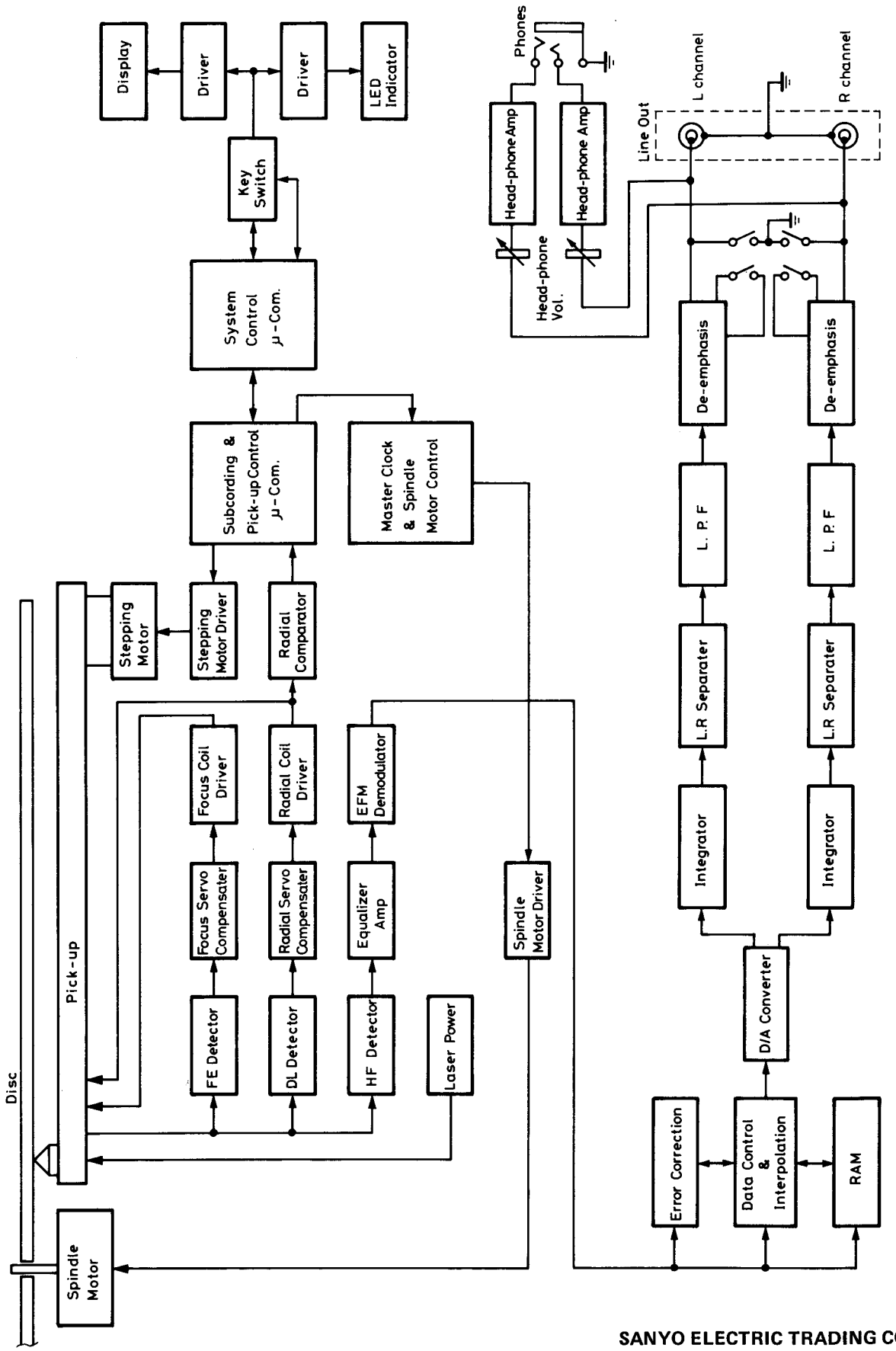
64

## 18. MECHANISM PARTS LIST

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| MECHANISM (PM–DAD01) | | | |
| 1 | 141-2-310T-82500 | Bracket, Chassis | 2 |
| 2 | 141-2-311T-43600 | Chassis, Pick-up Base | 1 |
| 3 | 141-2-754T-38400 | Shaft, Stepping Motor | 1 |
| 4 | 141-2-747T-24400 | Bracket Lever, Stepping Motor | 1 |
| 5 | 141-2-856T-11100 | Spring Coil | 1 |
| 6 | 141-0-742T-95900 | Lever Ass'y, Stepping Motor | 1 |
| 7 | 141-2-581T-29000 | Gear, Helical | 1 |
| 8 | 141-2-856T-21300 | Spring Coil | 1 |
| 9 | 4-527T-20601 | Pulse Motor Ass'y, Stepping Motor | 1 |
| 10 | 141-2-853T-82000 | Spring Plate, Stepping Motor | 1 |
| 11 | 141-2-365T-57700 | Bracket Switch, Photo Interrupter | 1 |
| 12 | 141-4-250T-89900 | P.C.B. Ass'y, Limit Switch | 1 |
| PC 1 | 4-202T-50100 | ├Photo Interrupter | 1 |
| | 4-240T-45400 | └Socket, 3p CNS15 | 1 |
| 13 | 141-0-581T-28800 | Gear Ass'y, Pick-up Base | 1 |
| 14 | 141-2-754T-38300 | Shaft, Rail | 2 |
| 15 | 141-2-853T-81900 | Spring Plate, Rail | 1 |
| 16 | 141-2-421T-40200 | Special Screw, Angle Adjust | 2 |
| 17 | 141-2-310T-82300 | Bracket, Pick-up Base | 1 |
| 18 | 141-2-856T-11200 | Spring Coil | 2 |
| 19 | 141-2-457T-43700 | Special Washer | 1 |
| 20 | 141-2-310T-86600 | Bracket, Pick-up Base | 1 |
| 21 | 141-2-421T-40100 | Special Screw, Supporting Point | 1 |
| 22 | 4-527T-20401 | Commutate Motor Ass'y, Spindle Motor | 1 |
| 23 | 141-0-118T-02500 | Turn Table Ass'y, Disc | 1 |
| 24 | | Hexagon Socket Set Screw 2.6 x 6mm | 2 |
| 25 | 141-2-765T-02600 | Magnet, Disc | 1 |
| 31 | 141-2-671T-07100 | Cam, Loading | 1 |
| 32 | 141-0-378T-13300 | Bracket Motor Ass'y, Loading Motor | 1 |
| 33 | 141-2-856T-20600 | Spring Coil | 1 |
| 34 | 4-527T-20501 | Commutate Motor Ass'y, Loading Motor | 1 |
| 35(S401,402) | 4-238T-60000 | Switch, OPEN, CLOSE | 2 |
| 36 | 141-2-742T-96300 | Lever, Push Lever | 1 |
| 37 | 141-2-856T-10600 | Spring Coil | 1 |
| 38 | 141-2-581T-29100 | Gear, Herical | 1 |
| 39 | 141-2-581T-29200 | Gear, Cam | 1 |
| 40 | 141-0-742T-96000 | Lever Ass'y, Brake Lever | 1 |
| 41 | 141-2-743T-08000 | Arm, Pull Lever | 1 |
| 42 | 141-2-315T-27800 | Reinforcement | 1 |
| 43 | 141-2-856T-10500 | Spring Coil, Brake Stay | 1 |
| 44 | 141-2-742T-96100 | Lever, Holder Stay | 1 |
| 45 | 141-0-742T-96200 | Lever Ass'y, Stay Lever | 1 |
| 46 | 141-2-856T-10700 | Spring Coil | 1 |
| 47 | 141-2-310T-82600 | Bracket, Holder | 1 |
| 48 | 141-2-754T-37500 | Shaft, Holder | 1 |
| 49 | 141-2-210T-44600 | Bracket, Disc Holder | 1 |
| 50 | 141-4-250T-89800 | P.C.B. Ass'y, Disc Switch | 1 |
| PC 2 | 4-202T-50200 | └Photo Interrupter | 1 |
| 51 | 141-2-445T-28800 | Rubber Cushion, Disc | 2 |
| 52 | 141-0-747T-24500 | Bracket Lever Ass'y, Stay Bracket | 1 |
| 53 | 141-2-421T-40000 | Special Screw, Switch Shaft | 1 |
| 54 | 141-2-742T-96400 | Lever, Switch | 1 |
| 55(S403) | 4-231T-84201 | Switch Ass'y, Loading, PUSH | 1 |
| 56 | 141-0-661T-36200 | Pulley Ass'y, Chuck | 1 |
| 57 | 141-2-856T-10900 | Spring Coil, Chuch Lever | 1 |
| 58 | 141-0-742T-96600 | Lever Ass'y, | 1 |
| 59 | 141-2-754T-37900 | Shaft | 1 |
| 60 | 141-2-445T-29300 | Rubber Cushion, Chuck | 3 |
| 61 | 141-2-742T-96500 | Lever, Front | 1 |
| 62 | 141-0-747T-24600 | Bracket Lever Ass'y, Foot Base | 2 |
| 63 | 141-2-856T-10800 | Spring Coil | 1 |
| 64 | 141-2-311T-43700 | Chassis, Bottom | 1 |
| 81 | 141-2-457T-23800 | Special Washer, "E" Ring 1.5mm | 4 |
| 82 | 141-2-457T-23000 | Special Washer, "E" Ring 2mm | 5 |
| 83 | 141-2-457T-23100 | Special Washer, "E" Ring 3mm | |
| 84 | 141-2-453T-33100 | Special Washer 2mm | 1 |
| 91 | 123-2-472R-00601 | Lug | 2 |
| 92 | 141-2-472T-05700 | Lug | 1 |
| 93 | 141-2-472T-02200 | Lug | 1 |
| 94 | | Tube, 2$\phi$ x 15mm | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| FIXING PARTS | | | |
| Y01 | | Pan Hd. Screw 2 x 8mm | 3 |
| Y02 | | Pan Hd. Screw 2.6 x 3mm | 3 |
| Y03 | | Pan Hd. Forming Screw 3 x 4mm | 11 |
| Y04 | | Pan Hd. Tapping Screw 2.6 x 8mm | 5 |
| Y05 | | Pan Hd. Tapping Screw 3 x 4mm | 2 |
| Y06 | | Pan Hd. Tapping Screw 3 x 8mm | 5 |
| Y07 | | Pan Hd. Tapping Screw 3 x 12mm | 1 |
| Y08 | | Pan Hd. Tapping Screw 2 x 8mm | 2 |
| Y09 | | Binding Hd. Tapping Screw 3 x 6mm | 7 |
| Y10 | | Binding Hd. Tapping Screw 3 x 8mm | 2 |
| Y11 | | Flat Hd. Screw 2.6 x 4mm | 2 |
| Y12 | | Flat Hd. Tapping Screw 3 x 6mm | 1 |
| Y13 | | Pan Screw Washer Hd., 2.6 x 8mm | 2 |

## 19. BLOCK DIAGRAM




**SANYO ELECTRIC TRADING CO., LTD.**
33, Hiyoshi-cho 2-chome, Moriguchi-shi,
Osaka-fu, 570 Japan.



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